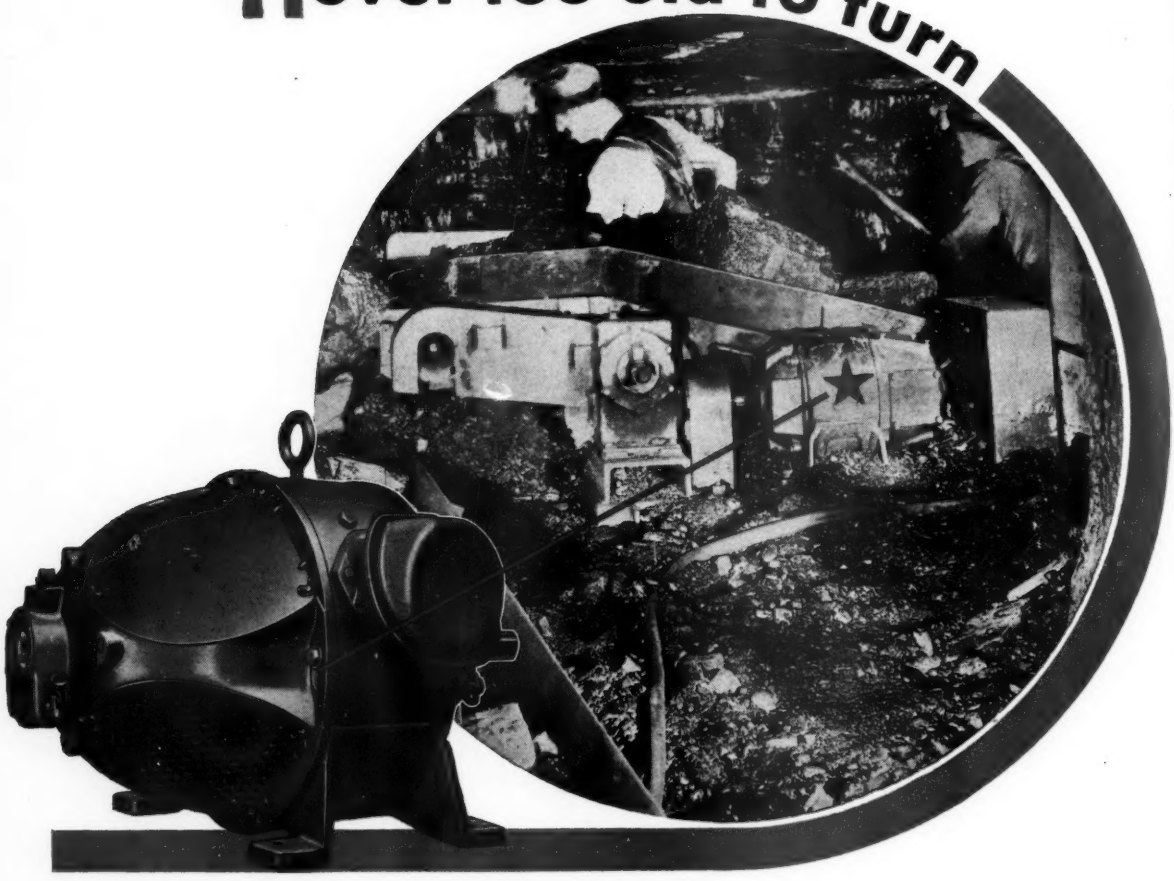
Mining CONGRESS JOURNAL

DECEMBER 1945

Merry Christmas — Happy New Year

Never too old to turn



Never too old—because any SK Motor ever built can be quickly rejuvenated and brought up to date. They have never changed in basic construction, and all improved parts have been designed to fit former models.

For instance, if you installed an SK Motor of the same rating and frame size every year since 1911—when they became a coal industry standard—you could fit any of them with the same spare armature. The same is true of armature coils, field coils and sealed-sleeve bearings.

Maintenance is greatly simplified and, even for a large user, the parts stock can be small.

Furthermore, SK Motors have been unsurpassed for 34 years in dependability and economical service. For further details, see your Westinghouse representative, or write to Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.

J-21362

Why more Westinghouse SK Motors are used in coal mines today than all other makes combined

One-piece rolled steel frame—with drop-forged steel feet welded to frame, gives great mechanical strength.

Separate coil units—shunt, series and commutating coils are wound and insulated as separate units, simplifying replacement.

Sealed-sleeve bearings—with exclusive Westinghouse vestibule seal keep oil inside, keep dust and dirt outside.

Form-wound armature coils—on larger sizes are insulated with specially selected mica on slot portion and dipped and baked in long-life varnish. Smaller sizes have mush-wound coils.

Readily accessible brushes—easily adjusted or removed. Any one brushholder can be removed without disturbing others.

Field coils are wound on a one-piece Micarta shell with end washers punched to exact size, protecting the coil against dirt and moisture.

Commutators are made of punched, hard-drawn copper for uniformity, better commutation and longer brush life.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

SK MINING MOTORS

Mining Congress Journal

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VOLUME 31, NUMBER 12 FOR DECEMBER 1945

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FRONT COVER: Pike's Peak as seen from the road between Colorado Springs and Cripple Creek. Photo, courtesy Merrill Shoup, Pres., Golden Cycle Corp.

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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THE AMERICAN MINING CONGRESS
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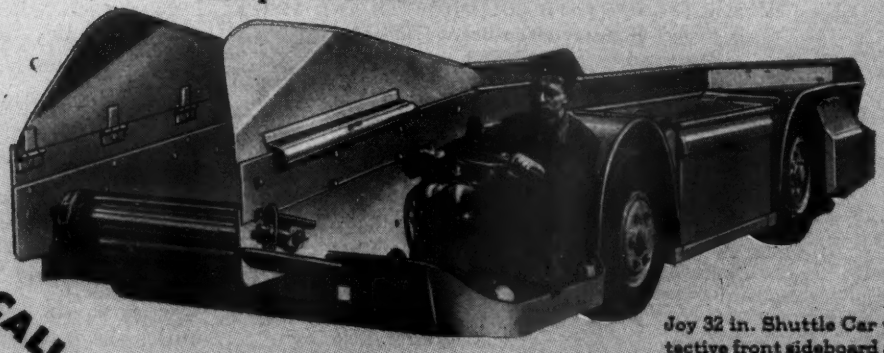
Member, Audit Bureau of Circulation.

THE JOY 32" SHUTTLE CAR

can be *Quickly Serviced* with a minimum of "time-off"...

Joy equipment designers consider each detail of construction thoroughly from the viewpoint of on-the-job servicing of that particular unit. As a result, not only the Joy 32" Shuttle Car, but all equipment coming from our plant, incorporates time saving features for check-servicing or repairs—resulting in a minimum of lost production time.



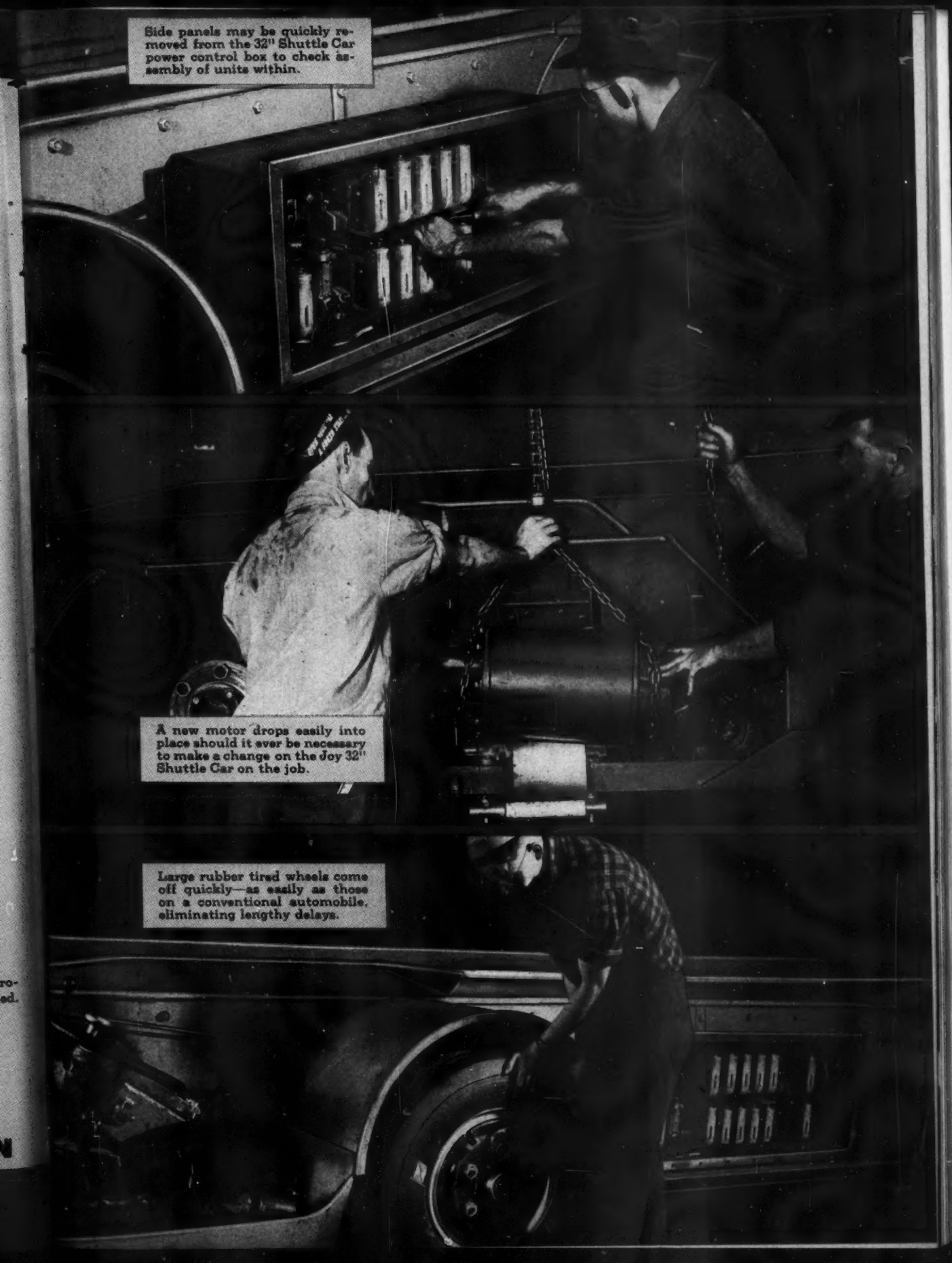
Joy 32 in. Shuttle Car with protective front sideboard attached.

CALL IN A JOY ENGINEER

NO OBLIGATION

JOY MANUFACTURING CO.

FRANKLIN, PA.



Side panels may be quickly removed from the 32" Shuttle Car power control box to check assembly of units within.

A new motor drops easily into place should it ever be necessary to make a change on the Joy 32" Shuttle Car on the job.

Large rubber tired wheels come off quickly—as easily as those on a conventional automobile, eliminating lengthy delays.

Tireless TIGER BRAND helps you *handle more material per day!*

Excellay Preformed

DAILY tonnage depends upon keeping equipment *actively* on the job. Time out for repairs, replacements or adjustments cuts down productiveness—cantankerous lines also lower efficiency of materials handling machines. That's why contractors and operators prefer TIGER BRAND Wire Rope.

U·S·S American TIGER BRAND Excellay Preformed Wire Rope has *Stamina* to stand up under the hardest usage encountered in grueling work of this kind. *Strength, Toughness* and *Flexibility* are reflected in the longer, trouble-free service it gives.

TIGER BRAND's high resistance to bending fatigue, its ease of handling and non-kinking, non-rotating characteristics are built-in advantages that will make your wire-rope-rigged equipment more efficient.

Prepare now for the busy days ahead. Check over your equipment. Plan to re-rig with TIGER BRAND—and *be sure to specify* TIGER BRAND Wire Rope when buying new equipment.

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air.* American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

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Cleveland · Chicago · New York
COLUMBIA STEEL COMPANY, *San Francisco*
United States Steel Export Company, New York
UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

LUG MORE PAY with an INTERNATIONAL

• Size for size, you can't beat an International Crawler for sheer lugging ability.

On the difficult or heavy haul, through sand or mire, ice or snow, with temperatures high or beastly low, this powerful Diesel tractor goes through with power to spare, dragging its 10- to 13-yard load to the chute.

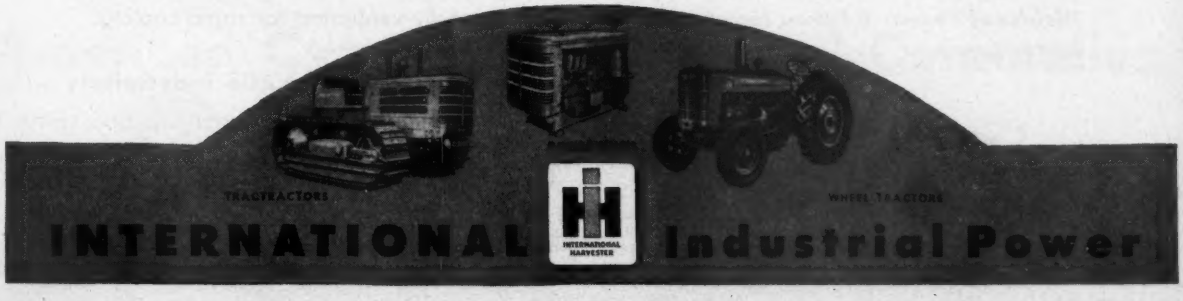
More paydirt per trip and more pay for the work are the advantages any International Tractor offers. Brute lugging power assures the first—unbeatable economy of fuel and maintenance guarantees the latter. And quick, easy starting—in any kind of weather—avoids delays, puts International Power on the job in a hurry.

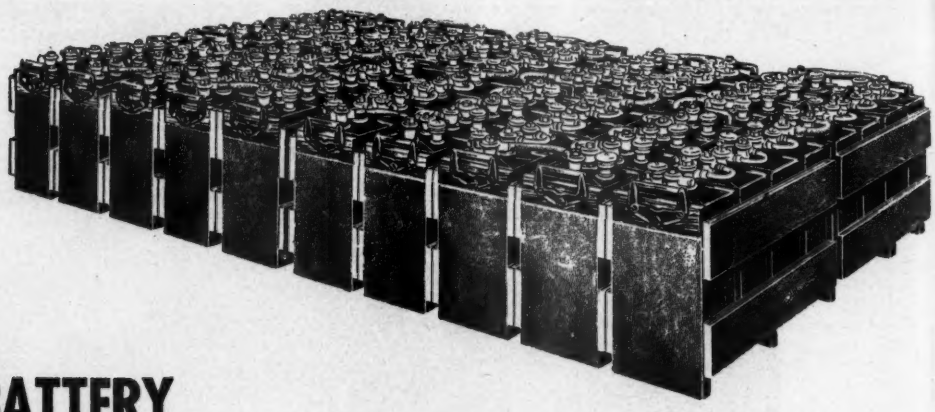
Get hold of the International Industrial Power Distributor in your territory and put it up to him to demonstrate the facts, to help select the type and size International that will work best in your operations.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue **Chicago 1, Illinois**





USE the Haulage BATTERY with these Cost-Cutting Advantages

These inherent construction and operating advantages are principal reasons why Edison Alkaline Batteries provide the closest approach to failure-free uninterrupted haulage power it is possible to obtain; give longer service life than other types of batteries; are so simple to maintain, and consequently, so economical to use. Because of their unequaled dependability and long, trouble-free life, alkaline batteries are helping users to keep down haulage costs. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

In Mine Locomotives and Shuttle Cars, Only Edison Alkaline Batteries Give You These Important Advantages:

- They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.
- They are **simple and easy to maintain.**
- They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury, without attention, and without expense.

Edison

ALKALINE BATTERIES

Available-

AMERICAN
CYANAMID & CHEMICAL CORPORATION

EXPLOSIVES

• *Magazines*
* *Plants*

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From well-located plants and distributing magazines, AMERICAN explosives and blasting supplies are available for delivery throughout the eastern and middle-western sections of the United States. Produced under intensive research, chemical control, inspection and unremitting care in manufacture, there is an AMERICAN explosive suited to your requirement.

• *Capable field engineers are available at your call.*

★ **HIGH EXPLOSIVES**

★ **PERMISSIBLES**

★ **BLASTING POWDER**

★ **BLASTING ACCESSORIES**

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

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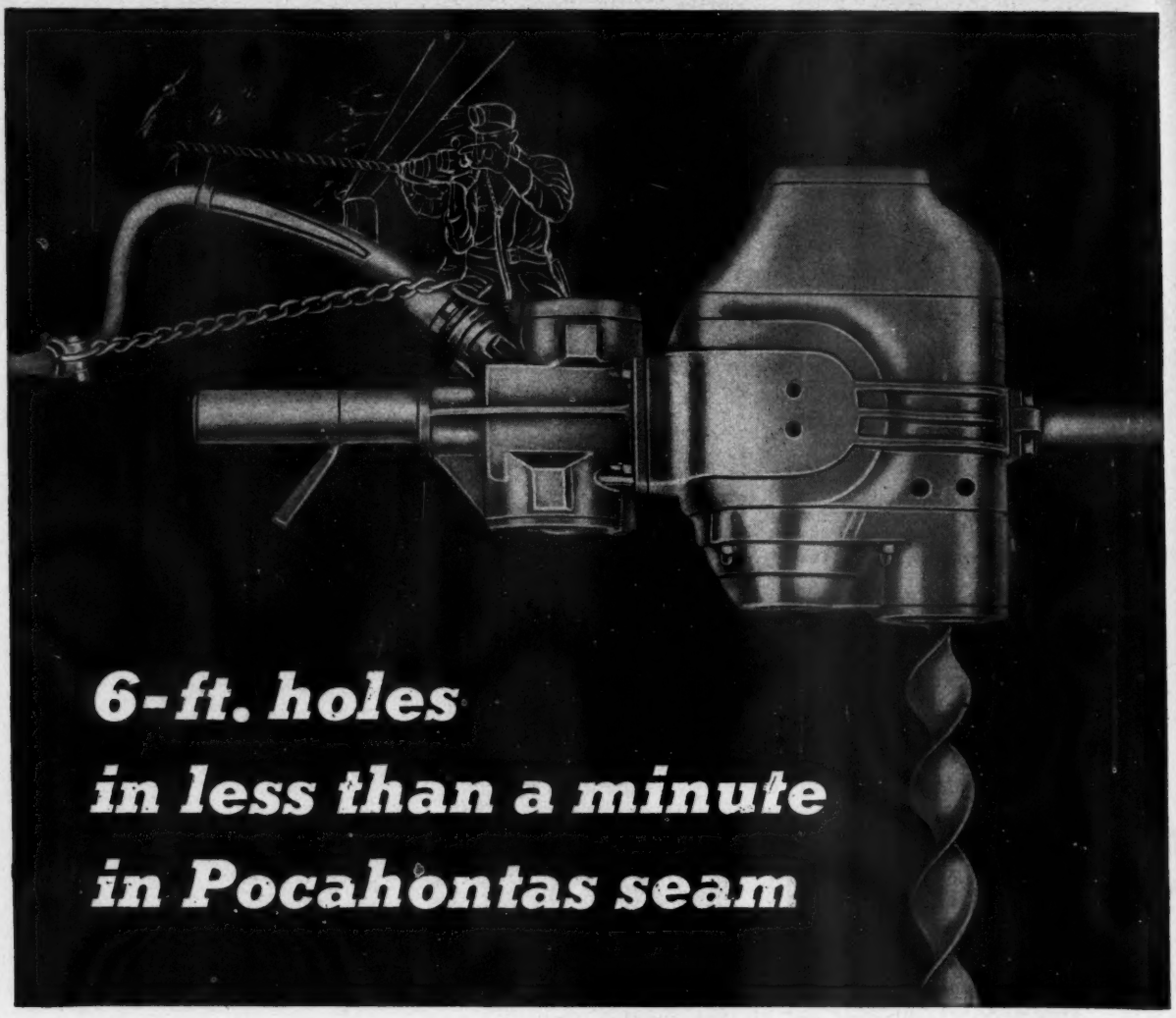


CP-571 Hand-Held Electric Coal Drill

WORLD'S fastest electric coal drill, the "Whippet," CP-571 Hand-Held Drill is equipped with a powerful, compound-wound D.C. motor and special safety clutch, enabling it to set new highs in drilling speeds. Six-foot holes in less than a minute in Pocahontas Seam is typical of the "Whippet's" outstanding performance.

Easily handled by one man in softer coal seams, the CP "Whippet" weighs only 40 lbs. in Open type – 43 lbs. in Permissible model.

Ideal for close quarter work, the record-breaking CP-571 drills parallel holes within 2" of top and bottom. Write for SP 1995, giving full data on the CP Hand-Held "Whippet."

Chicago Pneumatic manufactures the world's largest line of Hand-Held and Post-Mounted Electric Coal Drills: five sizes in the Hand-Held types and four sizes in the Post-Mounted models.

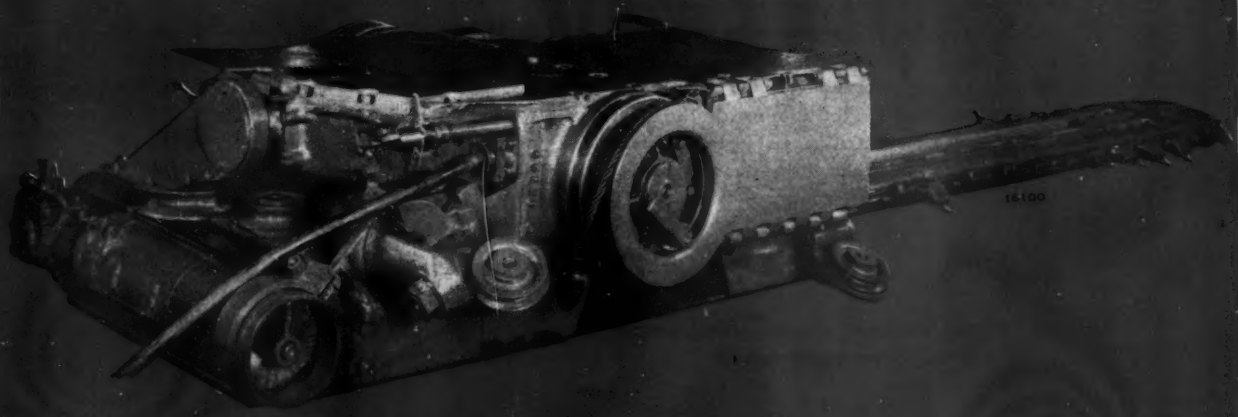
★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

THE GOODMAN 512 SHORTWALL with Bugduster

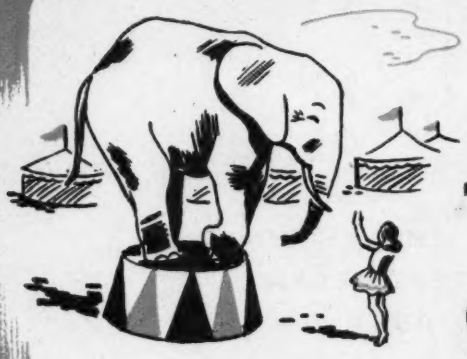
HAND SHOVELING ELIMINATED
KERF IS KEPT CLEAN
NO DUST



The Bugduster is a screw type conveyor that collects the slack as it is discharged and forces it into the bottom of the pile that forms at the rear and side of the machine away from the direction of cutting.

The Bugduster is powered from the main motor by a chain drive through an overload clutch. It can be stopped or started while the main motor is running. As a safety measure the inspection cover cannot be opened without first disengaging the drive clutch.

GOODMAN MANUFACTURING COMPANY
HALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS



How to keep an Elephant happy—

Circus owners say an elephant works best when fed a well-balanced and ample diet. It's the same story with your loaders, cutters and other expensive face machinery . . . elephants for work in any man's language. Only when such equipment is fed an ample supply of uninterrupted power can it produce coal at top efficiency. If the best interests of mechanization are to be fostered, considerable thought should be given the feeder distribution system.

In planning such a system, two principles should be kept in mind . . .

1. **Well-balanced circuits, using ample but not extravagent copper.**

2. **Properly suspended circuits protected against grounding and breakdown.**

For the best method of suspending mine feeder circuits, standardize on O-B Bulldog Feeder Slings. They may be used in countless combinations, a few of which are illustrated here. Put O-B Bulldogs to work on your feeder system and make certain your face "elephants" are getting their proper diet . . . a steady flow of electrical power.

Ohio Brass

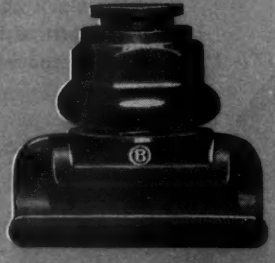
MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

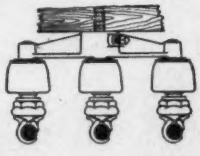
2568M

5 WAYS TO USE O-B BULLDOG FEEDER SLINGS

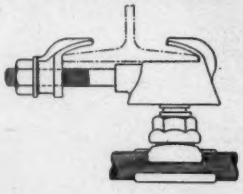
To suspend feeder from mine roof using suspension bolt and K-3 Hanger. May also be installed horizontally.



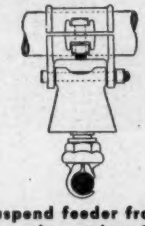
To attach feeder to timber using Type H-3 Hanger. May be installed vertically or horizontally.



To suspend three feeders side by side from triple yoke.

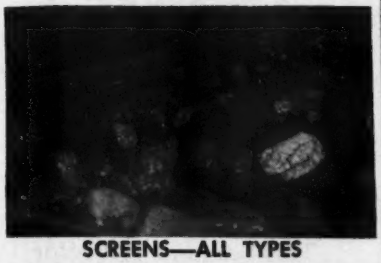


To suspend feeder from I-beams using I-beam Hanger.



To suspend feeder from pipe construction using Type N Swiveled Pole Bracket Hanger

WASHING UNITS



SCREENS—ALL TYPES

PICKING TABLES

CAR DUMPERS AND HAULS

BELT CONVEYORS

LOADING BOOMS

AS SPECIALISTS in the design, manufacture and application of conveying, cleaning, crushing, sizing, drying, and blending equipment and power transmission machinery, Link-Belt engineers have acquired and learned how to apply an extensive knowledge and experience, effectively, to the solution of materials handling, preparation and power transmitting problems of all kinds. While we have designed and built many of the country's largest coal preparation plants, as well as metallic and non-metallic ore handling systems, we have also designed hundreds of the smaller ones and revamped many others by the installation of individual units or the modification of existing equipment.

ENGINEERING SERVICE

Submit your problems to Link-Belt. Our experienced engineers will analyze your requirements and make impartial, constructive recommendations. Write today!

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

10,103

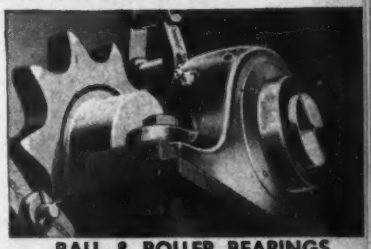
HEAT DRYERS

COAL SIZER-CRUSHERS

CONVEYORS—ALL TYPES

MALLEABLE, PROMAL & STEEL CHAIN

SPEED REDUCERS AND VARIATORS



BALL & ROLLER BEARINGS

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT

FREE!

This beautiful, full-color poster, painted by the well-known illustrator, N. C. Wyeth, is yours for the asking. Printed on heavy paper, size 27½" x 43½", this attention-compelling poster is ideally suited for posting in industrial plants and offices.

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CHEMICAL MATERIALS FOR INDUSTRY

HERCULES POWDER COMPANY 934 *King St., Wilmington 99, Del.*

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I understand that this places me under no obligation whatsoever.

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IN-225

WILL THIS SELLER'S MARKET LAST?

CLIFFS Dependable COALS C I C

During World War II coal requirements exceeded production and stockpiles were reduced below the margin of safety. Planned selling was impossible. Coal was distributed under U. S. Government regulations and directives, regardless of price, preparation or quality.

In the post-war period, competitive conditions will be restored. Planned selling will again be necessary. Cliff's organization has been kept intact to properly represent the producers of Cliffs Dependable Coals.

Many producers do not now have proper sales representation to efficiently distribute their output. We welcome their inquiry.

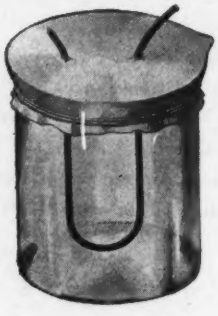
THE CLEVELAND-CLIFFS IRON COMPANY

UNION COMMERCE BLDG. • CLEVELAND 14, OHIO

Don't get mad, Monk. Your dousing is only a molehill compared to the mountain of abuse U.S. Royal Cords and Cables must absorb before being certified safety tested.

Precise and scientific laboratory tests, such as for moisture absorption, assure you Cords and Cables that more than meet all requirements—U. S. Royals are also subjected to heating, freezing, bending, stretching and impact tests.

MOISTURE ABSORPTION TEST



Conductor Insulation: **9 inches of insulated conductor are immersed in distilled water at 70° C for 7 days. Conductor is then removed and weighed and amount of water absorbed calculated from the increase in weight—moisture absorption of U.S. Royal does not exceed 25 milligrams per square inch.**

Jacket Compound: **Sample of jacket compound of uniform 0.100 inch thickness with surface material removed is first weighed, then immersed in distilled water at 70° C for 7 days. It is then removed and weighed and the amount of water absorbed is calculated — U. S. Royal Mining Machine Cable jacket absorption not more than 60 milligrams per square inch.**

SPECIFY THE NEW U. S. ROYAL *Safety Tested* MINING MACHINE AND LOCOMOTIVE CABLES

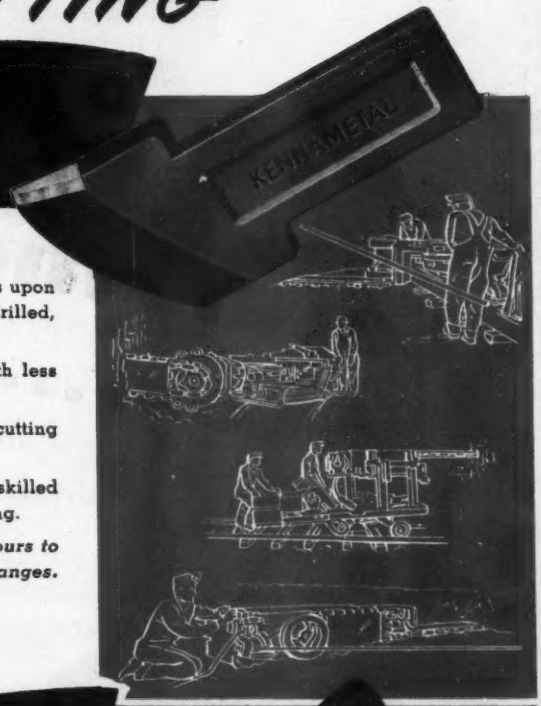
UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

SERVING THROUGH SCIENCE WITH ELECTRICAL CORDS AND CABLES

Companions in FASTER COAL-CUTTING

KENNAMETAL UNDERCUTTER BITS



The efficiency of every machine—and man—in your mine depends upon the small edge of the undercutter bit. For, before coal can be drilled, blasted, loaded, and transported, it must be cut.

Faster—Tough, hard Kennametal tips cut through normal face with less power; slice across more places before becoming dull.

Better—Less "bug-dust"; cleaner cutting close to bottom; harder cutting jobs made easy.

Cheaper—Exceptionally long life; idle machine time minimized; skilled men do more productive coal cutting, less unproductive bit changing.

Here's a typical performance report: With steel bits it took 2 hours to cut across 22 foot place in sulphur-streaked coal—three bit changes. Kennametal did same job in 15 minutes—no bit changes.

Kennametal Undercutter Bits are available for most standard chains.

KENNAMETAL DRILL BITS

Distinctive two-way drill bits also have brazed-in Kennametal tips, with cutting edges contoured for fast, uninterrupted drilling to accurate size throughout bit life, including many regrinds. Six sizes available, ranging from 1⅜" to 3", for hand-held, and track or post-mounted machines.

Augers are also made by Kennametal. Solid-center, heat-treated rolled steel shapes, to minimize whip. Double spiral for efficient hole cleaning. Driving shanks shaped for quick "twist of wrist" change.

These are representative results: One Kennametal bit drilled 275 feet of blast hole in bottom rock; another 850 feet in coal—before resharpening was necessary.

AND FOR MORE EFFICIENT STRIPPING

Kennametal Inc. produces four sizes of three-way drill bits—3½", 4", 5", and 6½", having cutting tips of Kennametal. They are speeding drilling operations in major stripping pits. One operator reports, "6½" Kennametal Bit drilled 900 feet, and wasn't dull enough to need resharpening". Another states, "A Kennametal Bit, used for a month, is still cutting faster than any other type bit we ever used."

Catalog M-1—giving specifications and prices of Kennametal Bits and Augers—will be sent promptly, upon request.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

Through the war years, the cost of the job was secondary to *getting that job done.* But from now on, COST—both operating and maintenance—will be the all-important factor in the purchase of new heavy-duty mining equipment. When it comes to deciding what kind of power will operate that equipment at lowest cost, don't overlook the proved-on-the-job advantages of high-speed Cummins Dependable Diesels . . . their demonstrated reliability and long life . . . their easy, economical maintenance and service . . . their high horsepower output per pound of engine weight. Models for all types of heavy-duty mining applications . . . hauling, stripping, loading or stationary . . . 50 to 275 hp.

CUMMINS ENGINE COMPANY, INC.
Columbus, Indiana

DID YOU KNOW?

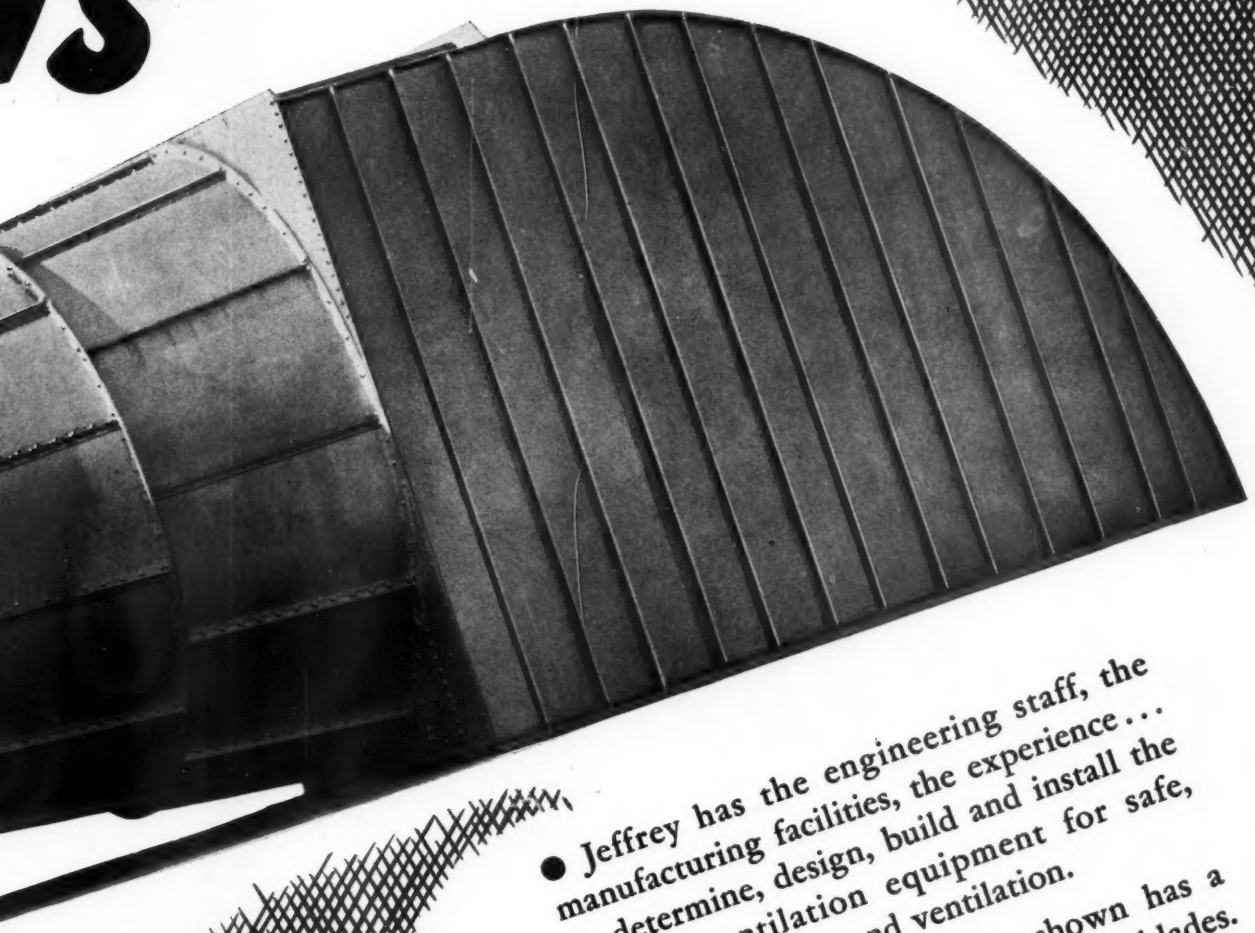
● That sulfa drugs are worth 800 times as much as the coal from which the basic chemicals are derived.

That Jeffrey Aerodyne Fans pass over a billion tons of mine air annually.

JEFFREY A
MINE FANS

AERODYNE

VS



● Jeffrey has the engineering staff, the manufacturing facilities, the experience... to determine, design, build and install the proper ventilation equipment for safe, efficient underground ventilation.

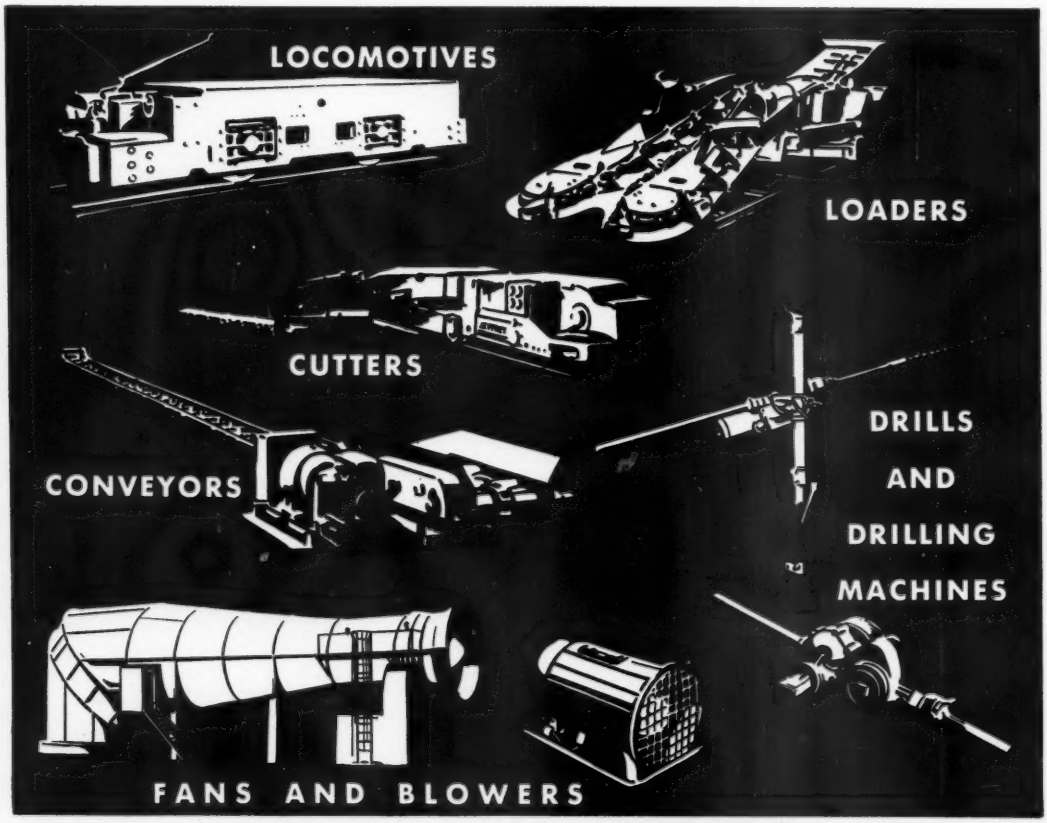
The Jeffrey 8-H Aerodyne shown has a 117-inch rotor with adjustable pitch blades. Capacity—550,000 cubic feet at 9" W. G. —840 R. P. M. at 1000 B. H. P.

Full descriptive bulletins available.

Jeffrey

EQUIPMENT FOR COAL MINES

JEFFREY SERVICE TO THE COAL MINES MEANS SERVICE TO ALL INDUSTRY



THE JEFFREY MANUFACTURING COMPANY

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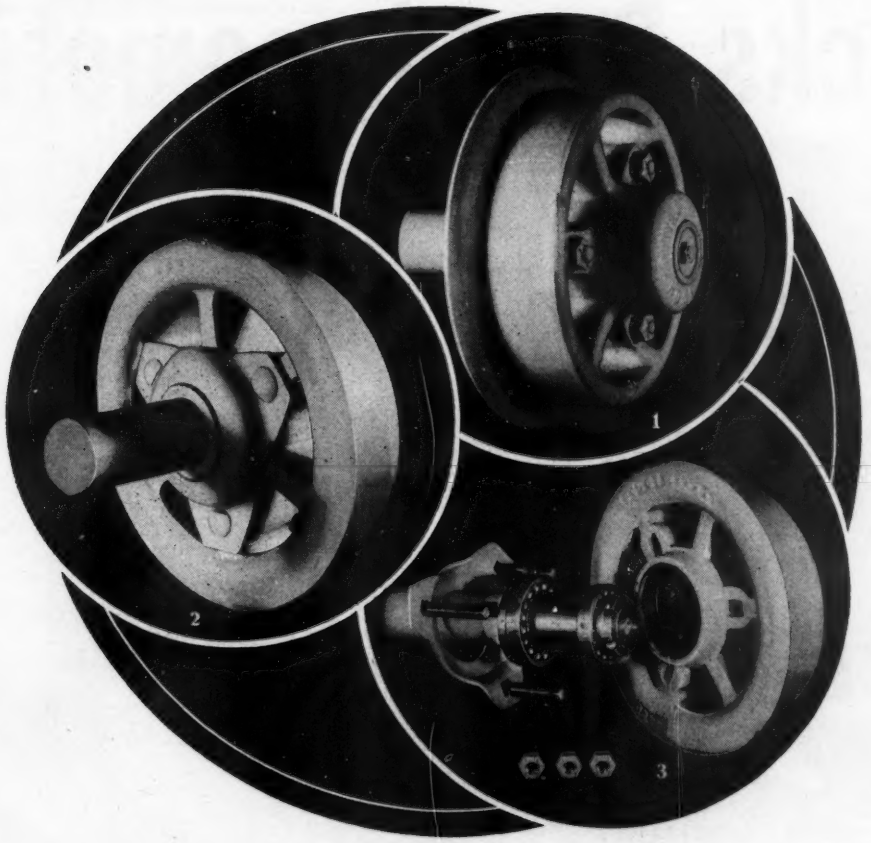

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THE ADVANTAGES: *(From a letter from Keith M. Callanan, Vice-President)*

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Mining CONGRESS JOURNAL

Published for the Entire Mining Industry by The American Mining Congress
S. A. TRENGOVE, Editor
Volume 31 DECEMBER, 1945 Number 12

Anti-Strike Legislation

A NATION-WIDE outcry against strikes implores new legislation to cope with industrial disputes. Work stoppages now endanger the general welfare, keep us all from the "things we've been waiting for," and contribute heavily to inflationary pressures. Hence the demand for some form of *regulation.*

A Gallup poll finds America 85 per cent in favor of the President's plan for "fact-finding" boards and "cooling-off" periods. Labor leaders, however, angered at *any plan* to curb the right to strike, have hurled none too complimentary rejoinders at the Chief Executive's attempt to protect the public welfare. Labor's touting of its "economic power" and its use of coercive force harmful to the reconversion, are adding to the damage wrought by those misguided unionization zealots who fostered the Wagner Act and other contributory legislation.

After enjoying its role as the pampered child of Government and the favored participant in industrial disputes for over a decade, it is small wonder that labor so strongly resists any transition from Government sponsorship to Government regulation.

But with all the shouting of labor leaders about "rights," it is realized that the right to strike is one which, like all other human freedoms, may need to be regulated in the public interest.

A great flood of strike control ideas is descending upon Congress. And we see that considerable care is wanted in preparing any new industrial dispute legislation. Danger lies in the creation of too drastic measures which can eventually shackle all industry with unbearable Government controls. Fact-finding boards, if they must be adopted, should be limited strictly to general welfare situations and to the finding and reporting of facts rather than making recommendations for settlement of disputes. They should not have access to confidential records of either unions or companies. Maintenance of status quo during the fact-finding period is of tremendous importance.

Beyond all this, and of basic importance in the future of industrial relations, is a reestablishment of equal status for employers and employes under the law. The one-sided character of the Wagner Act should be corrected, and management's right to manage should be sustained inviolate.

Making America "Mineral Conscious"

SECRETARY ICKES' gloomy *The War and Our Vanishing Resources* (American Magazine, December) sells American mining a bit short and may engender unwarranted "have not" thinking—so detrimental to general mining development.

Mr. Ickes lists us, not with Great Britain and Russia—possessing adequate mineral wealth, but with impoverished Germany and Japan, having "less than a 35-year peace-time commercial supply of 21 minerals."

While we do not take his warning lightly, we deny the implied inability to improve or at least maintain the current status. The greatest "know how" ever available to the industry is constantly improving our exploration techniques and utilization of lower grade ore materials. We expect this alone to carry us far beyond Ickes' forecast.

In contrast to dissertations which bewail our fate and lead to the drying up of investment capital, mining needs concerted campaigning and broad dissemination of facts to give the public and our legislative bodies the fullest information on our strategic industry. We need relief too from many existing curbs, like overly limited S.E.C. rulings, heavy taxation, low ceiling prices on metals *and constant land-grabbing threats by the Interior Department.*

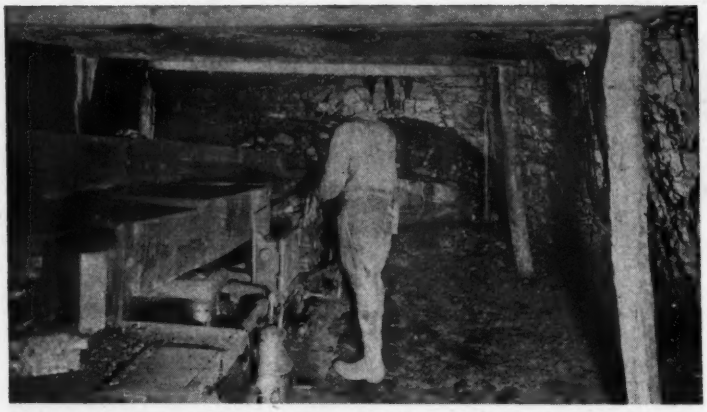
We in mining must exert every effort to make the Nation truly and patriotically "mineral conscious," that we may thus automatically refute unwarranted "have not" conclusions and bring about every legitimate inducement to American mining to build to its fullest ability. *This is the better way to meet future mineral emergencies!*

Meeting Competition

JOHN L. LEWIS recently exhorted anthracite miners to greater efficiency to counteract sales competition. Why he did not also prod the bituminous miners is not clear, unless his concurrent plans for a strike of supervisory employes might have made this embarrassing.

Exhortation to greater productive efficiency in coal mines is highly in order today since the wage problem (thanks to Mr. Lewis) is now the industry's biggest. Coal miners receive a gross wage much higher than that in competitive industries. Total 1944 pay roll is reported at $1,054,000,000, with average earnings at $2,752. Wages account for 65 per cent of coal mining costs—while in fuel oil, natural gas and hydroelectric power production they are reported to make up but 15 per cent.

The miners' responsibility in meeting competition is clear. If the UMWA is really on its toes it will go all out *right now* to encourage the highest possible productivity on the part of its members. This is the plain duty of mine labor in heading off the sharp gains already made by competitive fuels.



This loader has been developed so that discharge boom is adjustable in height and swing to properly transfer load to the car

Safety and Mechanical Coal Mining In Northern West Virginia

The Introduction of Mechanical Mining Methods Brought New Hazards, But Safety Records Show Considerable Improvement With Increased Mechanization. Good Supervision is an Extremely Important Factor in Accident Prevention

By JESSE REDYARD
Chief
and
ALEX BEESON
Inspector at Large
West Virginia Department of Mines

COMING into northern West Virginia with a paper on mechanical mining is what the English call "carrying coals to Newcastle," for it was in this district that that method of operation early became an important factor in production figures of our State, and in no other of our coal fields is so large a percentage of the output now mined mechanically.

In 1936 when the Department of Mines first separated the mechanically mined tonnage from the hand production, Monongalia County was first in the State in percentage of coal produced in that manner with 1,965,484 tons which was 33.2 per cent of the total, while Logan County with 2,777,623 was first in tonnage, but second in percentage with 17.6 per cent, truck and strip tonnage not being included.

Past Nine Years See Tremendous Increase in Modernization

In the nine years preceding and including 1944, mechanical tonnage has risen from 6,333,396 tons in 1936, to 79,242,990 tons, and for the first time exceeded the hand loading figure last year. In 1944, the counties of Harrison, Marion, and Monongalia produced a total of 27,318,604 tons of which 20,933,787 tons or 76.5 per cent, was mechanically mined; again strip and truck tonnage were not included. At the end of the all hand loading age, or 1935 to be exact, the number of tons produced per man shift in these counties was 6.0. The present mechanical tonnage is now 7.5 per man shift, not including the strip mined tonnage which is still giving the deep mine operators something to shoot at with their 15.5 tons per man shift. The reason for this tremendous increase in machine production is an interesting study in which some guess work is involved. Labor saving machines in coal mines are almost as old as the industry itself, and many mechanically inclined coal men have taken a whirl at building a device which would mine coal more economically than the tried and proven methods of the past, resulting usually in several varieties of headache to themselves, but likely contributing something to the present status of the industry, though it must be admitted that most designers are still short of the real objective which is a machine that will both cut and load the coal.

Depression Necessities Actually Helped

Early in the depression years, pioneer operators in some districts where coal is not so readily saleable, driven by stern necessity, and aided by better steel, more careful supervision and in some cases generous credit from machinery builders gave

Presented to Monongahela Valley Coal Mining Institute at Morgantown, W. Va., October 9, 1945.

mechanical operation the push necessary to make it not only successful, but during the manpower shortage of the war years, an absolute necessity.

That this initial development should largely occur in the Pittsburgh seam of northern West Virginia is logical, for no coal in the State offers better advantages for the use of mobile type loading machines with its thickness, lack of heavy binders, draw slate that can be held up, comparatively good roof, bottom conditions and grades, all of which counted in making it an ideal proving ground.

Two Schools of Thought on Safety of Mechanical Mining

With regard to the safety of mechanical operation as compared with hand loading, there are two schools of thought; one claiming that the rapid advance through the coal liberates larger quantities of methane, and that coal dust caused by machine operations both in suspension and accumulation tends to increase the explosion hazard, that the constant passage of cars and locomotives through brattice and doors are likely to derange ventilation and that hastily hung unfused or badly worn cables increase the fire risk. The other school argues that higher concentration of workings means more thorough supervision and rock dusting can more easily reach all workings. These things, plus fewer men employed underground to produce the required tonnage, all tend to keep the accident rate below that of hand mining.

In order to reach a reasonable conclusion in the matter, it is necessary to analyze the safety records of the State before and after the introduction of mechanization. Beginning with the year 1936 when such records were first made available, we find that the tonnage production per fatal accident was 350,846 as compared with 527,010 in 1944, which is the best record in the State's history. The tonnage production per non-fatal accident was 8,587 in 1936, and 14,657 in 1944.

A breakdown of the causes of fatalities shows that falls of roof and side now cause 50 per cent of the fatalities as against 62 per cent in 1936; haulage 26 per cent as against 22 per cent. Explosion of gas or dust show no change and remained at 5.5 per cent of the total. Other causes are about the same as far as percentages go.

It is difficult to compare the non-fatal accident figures of 1936 with those of recent years, as at that time we carried three kinds of accidents in our Annual Report—fatal, non-fatal, and minor, the last category being no longer used and all non-fatal accidents being designated as such. However, by combining the minor and non-fatal accidents inside the mines in 1936, the total is 3,453, or 23.4 per cent as compared with 2,937, or 20 per cent in 1944; haulage 4,053, or 27.6 per cent as against 3,863 or 26.6 per cent, and falls 4,005 or 27.2 per cent, as compared with 2,860 or 19.5 per cent.

Some Other General Improvements

Of course, it cannot be asserted that this general improvement in the accident rate is due entirely to the large increase in mechanically mined tonnage. Among other improvements in mining practices, I consider systematic timbering as the most important. Many mining companies now post blue print timbering plans in conspicuous places and instruct their employes carefully in carrying them out, and the substantial decrease of 12 per cent in accidents from roof falls shows that they are getting results. More thorough rock dusting and better ventilation have likely been factors in improving our safety record as well as generally improved mining and inspection methods. However, it can certainly be said that mechanical mining is safer than the older way, but by exactly what percentage it is difficult to estimate at present since many of our large mines still use both methods, and most of the mines of the State having the worst natural conditions are completely or partially mechanized.

Mechanical mining methods are now pretty well shaken down into fixed plans. In conveyor mines, coal is loaded in the room by gathering units and delivered by them to a main belt into cross entries and by it to mine

Loading machine discharging into shuttle car *Photo, courtesy Consolidation Coal Co.*

cars or main line belt for transportation to the outside. The general plan conforms closely to the old room and pillar method of mining with differences in the width and length of the working places.

Where mobile type loading machines are used, multiple entries are driven into the coal, the number varying according to the height of the seam and what the management considers necessary to produce the maximum tonnage from one machinery unit, and all places are usually the same width. Since by far the greatest portion of our mechanical tonnage comes from mobile equipment (60,000,000 tons as compared with 20,000,000 from conveyors), and the most radical departure from our previous mining method occurs in its use; the following remarks will be more generally concerned with it and especially its application in this particular district.

The Problems of Proper Width and Alignment

The study of accident reports gives us the impression that there is a tendency to drive all places in mechanical mines too wide, and it must be admitted that the saving in cutting, shooting, loading, and most other items entering into the coal cost offers a temptation in this respect that it is difficult to resist.

In the day of the breast cutting machine, about 11 ft. or 4 cuts was considered the proper width for an entry in this district. However, with the advent of track mounted cutting machines and later the mobile type loader, this was increased to 14 ft. applicable to both rooms and entries, and now it is common to find places driven 18 to 20 ft. in width with only 14 ft long 4 x 6 cross bars on 5 ft. centers as support. When pickups and breakthroughs are turned off the entries, and especially when the first two cuts are being taken out of them, a timbering problem arises which is very difficult to handle, and it is even more serious when these places are turned off at a 60° angle which is now a common practice. During both the cutting and loading of such places so much extra weight is thrown on the area over and around the machines as the coal support is removed as to make the tramming back of the cutting machines at the end of the cut and loading of the last few cars from these newly turned off places the most dangerous period in the entire cycle of mechanical operation. For it is impossible to use the five sets of cross bars back of the face which are customary in straight entries or any cross bars, in fact in the pickup till the first cut is loaded out so that the only recourse is plenty of safety posts with good caps, rigid supervision, and frequent testing of the roof.

Next in importance to maintaining a conservative width in mechanically mined places is keeping them straight. Most operators now drive not only the entries but the breakthroughs and pickups on sights, and have the face bosses extend these sights and mark the center line of the place at the face each shift which is naturally an aid to the cutters in keeping on line. Some engineers now advocate marking a continuous center line on the roof of all places as an aid not only to the cutters, but to the timbermen, bratticemen, and track layers so that all the work in the place will be of a permanent nature. No timber will have to be reset, frogs relocated, and most important of all a uniform area be provided behind the line brattice so that an ample volume of air may be kept sweeping the working faces.

Keep Ventilation Adequate at All Times

The ventilation of a mine worked on the multiple entry system is not so simple as it would seem, for while it is an easy matter to carry a good volume of air up the haulage entry which is naturally the inlet, getting the air across to the side entries and back through the return airways is something else again. This is due to the number of falls which are bound to occur in overwidth entries especially where pickups or breakthroughs have been turned off. These intersections, especially when at an angle, require heavy timber and even when cross bars are left in place they cannot support this weight for any great length of time and the resulting falls are often so high that they almost block the return entries as far as ventilation is concerned.

In this multiple system of mining one outside entry is usually the inlet and haulage on account of simplifying the ventilation when cross entries have to be turned off, which theoretically makes all the other parallel entries in the same panel returns from a point two or three breakthroughs back of the face. However, due to the numerous falls at pickup intersections just mentioned, these returns in time become badly congested and the resistance to the air current gets too high. It seems to me that where one outside entry is the inlet in the ventilation system, the one on the opposite side of the panel should be considered the main return and every effort should be made to keep it open. This can best be done by center posting with one or two rows of posts depending on the width of the place with a good cap piece over each post. These air courses should be patrolled frequently especially in the surprisingly large number of mines where no recording water gauge is used in the fan enclosure as an indication of the condition of the airways.

Air Short-Circuits, Coal Dust and Rock Dusting Are Matters for Constant Attention

Another important consideration in the ventilation of these rapidly moving places in mechanical mines is the line brattice. It should be installed on the inlet side of the entry; should be straight; have ample area behind it and nailed to supports both top and bottom, and carefully supervised during working hours to prevent the constant traffic through the curtains and doors from short circuiting the air from the working faces.

The hazard from coal dust is probably increased at the working faces of mechanical mines but preventative safety measures are easier due to con-

The chain conveyor has come into wide usage in transfer of coal underground

centration of workings. In my opinion the best method of allaying coal dust is through water lines at the working faces for with an ordinary garden hose the dust cannot only be kept down while cutting and loading is going on, but the cars can be wet down while in the working places so that they will leak water on the haulage ways near the working faces and keep them damp.

In this particular district where the volatile content of the coal approaches 40 per cent and is the highest in the State, necessity for thorough rock dusting is apparent and on account of the height of the coal and the extent of the workings, large quantities are required. A study of our reports for the first half of 1945 shows that rock dust recommendations from our inspectors are well carried out in this district, a number of mines using as much as 5 lbs. of dust per ton of coal and one large mine a total of 6,430 tons in 1944, the largest quantity of any operation in the State.

In addition to complying with the mine inspectors' recommendations regarding the total amount of rock dust to be used, care must be taken that it is applied to that part of the mine where it is most needed, that is, inby the last breakthroughs where an initial gas explosion would be most likely to occur.

Haulage Road and Fire Hazards Require Increased Controls

The only type of fatal accidents to increase in percentage during the 1936 to 1944 period were those occurring on the haulage roads, and this may be due to the heavier equipment, higher speeds or pressure on the face crews to get out the coal in mechanical mines. These accidents are hard to deal with as many of them are outside the immediate range of supervision, and involve the personal element, but good track, better lighting, keeping equipment in repair, and rigidly enforcing rules of operation will all help to reduce these accidents.

The fire risk is greater in mechanical mines than in those worked under former methods. More oil and grease have to be taken inside and enough for one shift stored. There is also additional danger from electrical short circuits, and there are several instances on record of machines operating at the faces catching fire and burning up. Water lines at the faces are still the best preventative for coal fires, but modern type fire extinguishers should be on every section and carried on the motors as a preventative of grease or electric fires. Ample supplies of rock dust should be located where lubricants are kept and power cables hung on posts and vulcanized promptly when worn. I will not attempt to go into all the "dont's" possible in fire prevention, but as a precaution for the numerous fires that occur when the mines are idle, there is nothing as good as a well organized and carefully checked fire patrol. It may seem a needless expense to keep a fire boss in the mines on idle days, but when the cost of a mine fire is considered, it is well worth while.

Views on Importance of Good Supervision

It has not been my purpose in this paper to deal with questions concerning the observance of the mining law which I will leave for the present to the mine inspectors, but since invention usually keeps several jumps ahead of the law, I have tried to make suggestions which may help to keep our safety practices in line with the rapid advances in mechanical methods.

I would like to call special attention in concluding my remarks to haulage accidents which are the only ones to show an upward trend during the period covered, and would suggest that they be made a subject for discussion at regular safety meetings, and that our accident bulletins covering them be given careful study.

It must be kept in mind that we in this department cannot assume the management of the mines, and that the most important factor of all in maintaining safety standards is the attitude of the management itself. Officials that are alert and insistent that safety rules be carried out to the letter can more than compensate for bad natural conditions and carelessness spells danger no matter what the method of operation.

Seek Better Uses for Oregon Coals

Oregon coals for industrial carbon production will be studied by Oregon State College researchers under the terms of a cooperative agreement with the Bonneville Power Administration, Dr. Paul J. Raver has announced.

A memorandum of understanding signed by President A. L. Strand and Administrator Raver, marked this as the first of a series of similar industrial research projects which will be undertaken jointly by northwest educational institutions and the Bonneville Power Administration.

Research work will be conducted under the direction of Dr. G. W. Gleeson, dean of engineering at Oregon State College, and John N. Carothers, chief of Bonneville's industrial analysis section. Studies will include investigation of the possibility of removing sufficient ash from Coos Bay coal to produce a coke satisfactory for smelting operations at a cost competitive with other sources of smelting coke.

Outlining the Bonneville Power Administration's interest in utilization of northwest coals for production of coke, Ivan Bloch, chief of Bonneville's industrial and resources development division, pointed out that carbon, in one of several forms, is a basic material to electrochemical and electrothermal industrial processes.

"Our work with Oregon State College on this project is part of a broad program of research being undertaken in cooperation with universities and colleges in Oregon, Washington and Montana to develop new power markets in industries soundly based on the region's natural resources," Bloch said.

He declared that the Pacific Northwest's tremendous low-cost hydroelectric power resources constituted a powerful incentive to development of electro-process industries, but pointed out that availability of a satisfactory quality of carbon at a competitive cost also would be an important factor in the growth of this type of industry.

"Carbon is an essential ingredient in smelting operations for the production of calcium carbide, ferro-alloys such as ferrosilicon and ferrochrome, phosphates, silicon carbide, aluminous abrasives, iron ore reduction and other electro-processes," Bloch stated.

"If the research work which will be carried on during the next two years by the school of engineering at Oregon State College in cooperation with the Bonneville Power Administration proves that production of coke from regional coals is economically feasible, it will mean a big advance in the industrial potentialities of the Pacific Northwest."

Colorado Placer Mining

A Review of the State's Placer Mining Industry and Its Future

By H. W. C. PROMMEL

Consulting Geologist and Mining Engineer
Denver, Colo.

EVEN though it creates new wealth, gold mining in the United States was not considered an essential industry during the war and was closed down by Government order. Now that peace has returned and the Gold Mining Closing Order has been voided, will Colorado's placer mining industry stage a comeback from its lowest ebb in 1943 and 1944 and continue to surge forward as it did from 1931 to 1942? Let's take a look at the record.

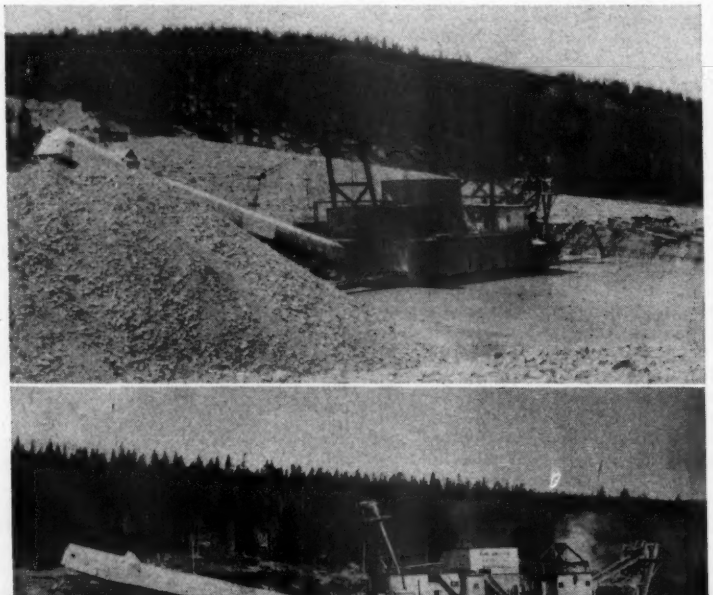
By the end of 1944 the total value of gold produced in Colorado from its lode and placer mines was $852,380,824. Of this amount $815,539,474 or 95.68 per cent was produced by its lode mines while its placers contributed $36,841,350, or 4.32 per cent. Geologic and topographic conditions in the western part of the state warrant a much higher placer gold production than has thus far been obtained.

Summit County Ranks First in Placer Gold Production

The value of Colorado's gold production is shown on Table 1 * which gives the production value by counties arranged in order of rank of lode gold production; it also shows their placer gold production and their rank in placer gold production. Plate I is a graph of Colorado's lode gold production from 1868 to 1944, inclusive, while Plate II is a graph of its placer gold production for the same period. 49.16 per cent of the lode gold was produced in the Cripple Creek District, Teller County, while the greater part of the remainder was obtained in 40 other counties from complex ores which also produced silver, copper, lead and zinc. Summit County yielded 42.42 per cent of Colorado's placer gold, while 36 other counties produced the remainder.

The first ten years of mining in Colorado, from 1858 to 1867, inclusive, prior to the discovery of gold at Cripple Creek, represent the flush gold production period. Free gold was mined and sluiced from rich vein outcrops as well as from shallow placer deposits near them and it is difficult to divide the gold production for this period into lode and placer mine production. However, the late Dr. Charles W. Henderson, of the U. S. Bureau of mines, allocated $10,097,886 to lode mines and $14,923,918 to placer mines of the state.† The placer gold production for this period, by counties, is shown on Table 2. Counties were as yet large and had not been subdivided into the 63 counties which now form the State of Colorado. Only small scale production methods were used. Five counties produced 98.3 per cent of the total placer gold production; the total number of producing counties was six.

By 1868 much of the rich surface gold had been mined, more counties had been established and better production records were kept. Table 3 shows the value of placer gold production from 1868 to 1944, inclusive, arranged by counties in order of their



Top: The old Sterns dredge on Blue River, Summit County. Dismantled in 1938 and taken over the 11,300 ft. Hoosier Pass to Beaver Creek, Park County.

Below: Same dredge reassembled on Beaver Creek, operating as Timberline Dredging Company's No. 1 dredge uftil closed down by L-208.

* Statistical data in this article are based on U. S. Bureau of Mines annual reports and other sources.

† Henderson, Chas. W., U.S.G.S. Prof. Paper 108, Mining in Colorado, 1926.

TABLE 1

COLORADO. TOTAL LODE AND PLACER GOLD PRODUCTION. 1858-1944, INCLUSIVE. BY COUNTIES

Year Disc	Rank Lode	Counties	LODE GOLD: Lode Gold Prod. Value in Dollars	Per Cent of Total Lode Gold Prod.	Accumulated Percentage	PLACER GOLD: Placer Gold Value in Dollars	Per Cent of Total Placer Gold Prod.	Rank Placer
1891	1	Teller	$400,948,065	49.16	49.16	$12,142	—0.09	19
1859	2	Gilpin	88,202,024	10.82	59.98	6,479,550	4.02	6
1875	3	San Miguel	72,523,984	8.89	68.87	206,143	0.56	9
1859	4	Lake	53,557,294	6.57	75.44	7,308,290	19.83	2
1887	5	Ouray	40,329,067	4.95	80.39	4,299	—0.09	26
1873	6	San Juan	35,019,135	4.29	84.68	13,161	—0.09	18
1859	7	Clear Creek	29,118,696	3.57	88.25	2,914,408	7.91	4
1859	8	Park	26,900,211	3.30	91.55	6,423,464	17.44	3
1859	9	Boulder	24,323,630	2.98	94.53	71,963	0.20	12
1880	10	Eagle	8,447,288	1.04	95.57	7,847	—0.09	21
1870	11	Rio Grande	6,833,566	0.84	96.41	7,213	—0.09	22
1859	12	Chaffee	6,103,375	0.75	97.16	1,651,373	4.48	5
1859	13	Summit‡	5,556,572	0.68	97.84	15,627,868	42.42	1
1878	14	LaPlata and Montezuma	4,690,615	0.58	98.42	1,582	—0.09	29
1861	15	Gunnison	2,889,564	0.35	98.77	24,877	—0.09	14
1891	16	Mineral*	2,883,091	0.35	99.12	.....	....	..
1872	17	Custer*	2,218,757	0.27	99.39	.....	....	..
1879	18	Delores	2,189,740	0.27	99.66	663	—0.09	31
1875	19	Hinsdale*	1,477,026	0.18	99.84	.....	....	..
1880	20	Pitkin	583,034	0.07	99.91	220	—0.09	32
1880	21	Saguache*	426,204			.....	....	..
1881	22	Fremont	86,519			4,501	—0.09	25
1885	23	Garfield	47,623			40	—0.09	35
1861	24	Conejos*	39,306			.....	....	..
1858	25	Jefferson‡	38,102			348,544	0.95	8
1886	26	Montrose‡	21,280			76,392	0.21	11
1895	27	Larimer and Jackson	20,394			17,794	—0.09	16
1892	28	Routt and Moffat‡	19,355			456,017	1.23	7
1875	29	Costilla‡	15,218			32,264	0.09	13
1896	30	Grand	12,056	0.09	100.00	2,497	—0.09	28
1894	31	Delta	4,278			1,384	—0.09	30
1888	32	Miscellaneous‡	3,785			5,000	—0.09	34
1875	33	Huerfano	3,474			132	—0.09	33
1897	34	Archuleta*	2,819			.....	....	..
1887	35	Las Animas*	2,098			.....	....	..
1885	36	Mesa‡	981			5,066	—0.09	23
1886	37	Pueblo*	793			.....	....	..
1900	38	Baca*	292			.....	....	..
1928	39	Alamosa*	163			.....	....	..
1922	40	Adams†	.....			87,239	0.24	10
1858	41	Douglas†	.....			20,200	—0.09	15
1885	42	Arapahoe†	.....			16,729	—0.09	17
1929	43	Denver†	.....			8,449	—0.09	20
1926	44	Elbert†	.....			3,983	—0.09	27
1937	45	Rio Blanco†	.....			56	—0.09	34
			$815,539,474			$36,841,350		

Grand total, $852,380,824.

1858-1932 gold at $20.67 per oz.
1933 gold at $25.56 per oz.
1934 gold at $34.95 per oz.
1935-1944 gold at $35.00 per oz.

47 out of a total of 63 counties in Colorado have produced gold
41 out of a total of 63 counties in Colorado have produced lode gold
37 out of a total of 63 counties in Colorado have produced placer gold

31 counties have produced lode and placer gold
10 counties have produced lode gold only
6 counties have produced placer gold only

* Lode gold only.
† Placer gold only.
‡ Placer gold exceeds lode gold production.

production rank. Ten counties produced 98.46 per cent of all placer gold for this period. This came from a very small area as compared with the area of the remaining 27 counties which also produced some placer gold. Many potential placer gold regions in the state remain to be mapped and tested.

Five Production Periods are Noted

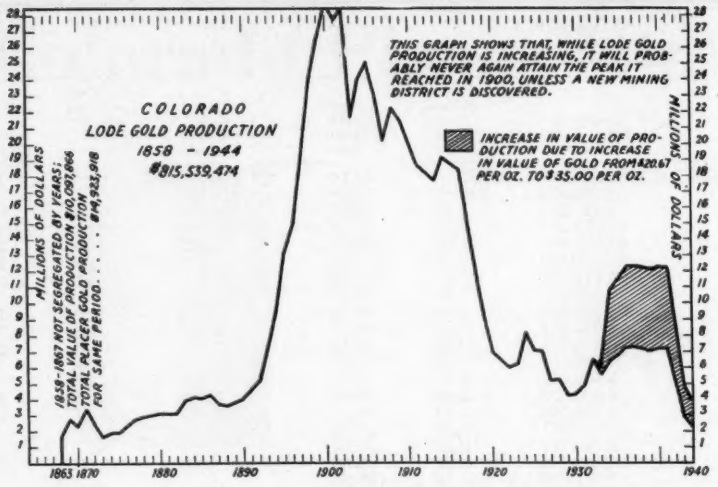
As shown on Plate II, the development of Colorado's placer mining industry can be divided into five periods, namely:

1859-1867—The flush production period.
1868-1907—Hydraulicking and groundsluicing.
1908-1931—Large bucket dredges.
1932-1942—Dry land, dragline floating, and bucket dredges.
1943-1944—World War II (small scale sluicing and gravel washing).

The flush production period has been described and figures for it shown on Table 2. Gulch deposits and steep grade streams were worked during the hydraulicking and groundsluicing period; its production record is shown on Table 4. Hydraulic elevators were used at several places where lack of sufficient grade prevented ordinary hydraulic mining. Summit and Park Counties lead in production but Chaffee County showed the steadiest record over the 40-year period. Production gradually declined toward the end of the period; high points during its last half are accounted for by flash production increases in San Miguel and Clear Creek Counties. Eight counties contributed 98.44 per cent of the total placer production while 11 additional counties yielded the remainder.

Placer Engineering, Testing and Evaluation Become More Important

Table 5 gives the value of Colorado's placer gold production for 1908 to 1931, inclusive. 96.34 per cent of it came from large bucket dredge operations in wide low gradient stream valleys which were not amenable to hydraulicking or groundsluicing. Such


COLORADO
LODE GOLD PRODUCTION
1858 - 1944
$815,539,474
THIS GRAPH SHOWS THAT, WHILE LODE GOLD PRODUCTION IS INCREASING, IT WILL PROBABLY NEVER AGAIN ATTAIN THE PEAK IT REACHED IN 1900, UNLESS A NEW MINING DISTRICT IS DISCOVERED.
INCREASE IN VALUE OF PRODUCTION DUE TO INCREASE IN VALUE OF GOLD FROM $20.67 PER OZ. TO $35.00 PER OZ.
1858-1867 NOT SEGREGATED BY YEARS; TOTAL VALUE OF PRODUCTION $10,206,866
TOTAL PLACER GOLD PRODUCTION FOR SAME PERIOD..... $14,923,918
MILLIONS OF DOLLARS
1865 1870 1880 1890 1900 1910 1920 1930 1940

dredges required initial capital investments of $100,000 to $500,000. The necessary prerequisite was large, proven yardage. Placer engineering and gold placer testing and evaluation entered more and more into the picture of gold placer mining. During this period of 24 years Summit County produced an equivalent of 98 per cent of the gold which it took 19 counties 40 years to produce during the preceding period. It produced $7,058,716 in 24 years to the 19 counties $7,201,638 production spread over 40 years. Production reached its highest, most sustained peak in 49 years. However, toward the end of the period there was a rapid decline to the lowest point in placer production ever reached since discovery of gold in Colorado 71 years ago. Lack of exploratory and development work, partial depletion of workable ground, litigation in Summit County, and the 1929 business boom followed by the depression, all contributed to this rapid decline. Ten counties produced 98.58 per cent of the total placer production while 13 counties yielded the remainder.

Placer Industry Increased in Activity During Depression

During the past, gold mining booms have followed business depressions; the years 1932 to 1942 were no exception. However, other causes contributed to the rapid production rise of placer mining in Colorado from its lowest point in 1931 to its highest value peak ever obtained in 1941, since gold was discovered in the State. Table 6 shows the value of Colorado's placer gold production for this 11-year period. This sudden and spectacular rise, which would have increased during 1942, 1943, and 1944 had not the Government's Gold Mining Closing Order L-208 interfered (in October, 1942), can be credited to three major causes, namely:

(1) Increase in the value of gold from $20.67 per oz. to $35 per oz.
(2) Improvements in machinery and equipment, making it possible to work placers of any type and reasonable size profitably.
(3) Great decrease in amount of capital investment required to get medium size placer properties to the producing stage.

Placer mining was carried on in 37 counties as compared with 23 counties during the preceding period. Summit County, which had been leading in production for years, gave way to Park and Gilpin Counties and took third place.

Moffat County, far removed from Colorado's mineral belt and ranking 28th in lode gold production together with Routt County produced more placer gold than Boulder County ranking 9th in total lode gold production. Douglas County, in the plains south

TABLE 2

COLORADO. PLACER GOLD PRODUCTION. 1858-1867, INCLUSIVE. BY COUNTIES
PERIOD OF FLUSH PRODUCTION

1	Lake	$5,272,000	35.3%	35.3%
2	Summit	5,150,000	34.4%	69.7%
3	Clear Creek	2,100,000	14.2%	83.9%
4	Park	1,780,000	11.9%	95.8%
5	Chaffee	380,000	2.5%	98.3%
6	Gilpin	241,918	1.7%	100.0%
		$14,923,918		

TABLE 3

COLORADO. TOTAL PLACER GOLD PRODUCTION. 1868-1944, INCLUSIVE

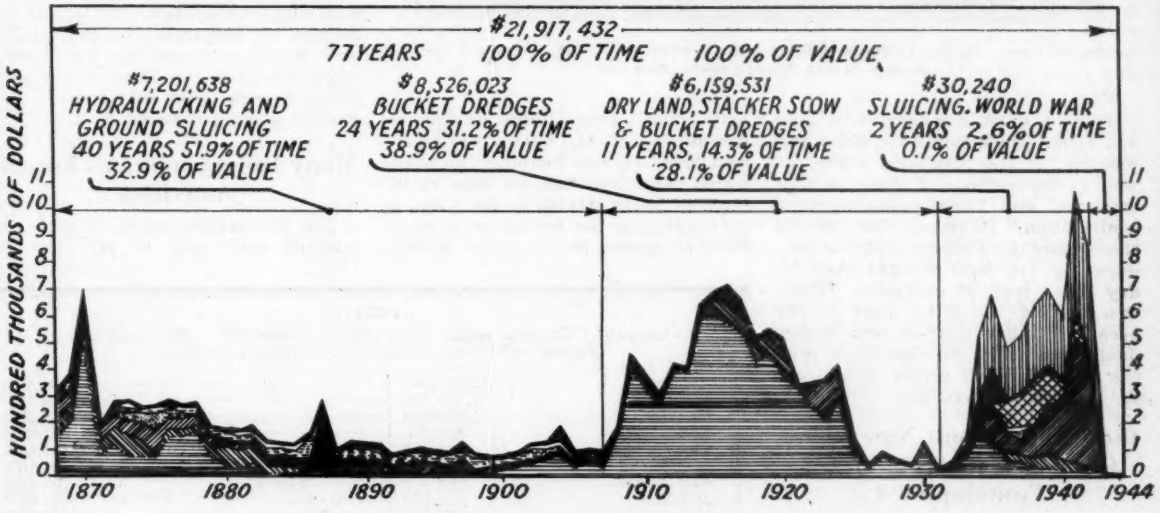
Rank	Counties	Inc. 77 yrs. 1868-1944	Per Cent of Total Production	Accumulative Production Percentage
1	Summit	$10,477,868	47.80	47.80
2	Park	4,643,464	21.19	68.99
3	Lake	2,036,290	9.29	78.28
4	Chaffee	1,271,373	5.80	84.08
5	Gilpin	1,237,632	5.65	89.73
6	Clear Creek	814,408	3.72	93.45
7	Routt and Moffat	456,017	2.08	95.53
8	Jefferson	348,544	1.59	97.12
9	San Miguel	206,143	0.94	98.06
10	Adams	87,239	0.40	98.46
11	Montrose	76,392	0.35	98.81
12	Boulder	71,963	0.33	99.14
13	Costilla	32,264	0.15	99.29
14	Gunnison	24,877	0.11	99.40
15	Douglas	20,200	0.09	99.49
16	Larimer and Jackson	17,794		
17	Arapahoe	16,729		
18	San Juan	13,161		
19	Teller	12,142		
20	Denver	8,449		
21	Eagle	7,847		
22	Rio Grande	7,213		
23	Mesa	5,066		
24	Miscellaneous	5,000		
25	Fremont	4,501	0.51	100.00
26	Ouray	4,299		
27	Elbert	3,983		
28	Grand	2,497		
29	LaPlata-Montezuma	1,582		
30	Delta	1,384		
31	Dolores	663		
32	Pitkin	220		
33	Huerfano	132		
34	Rio Blanco	56		
35	Garfield	40		
		$21,917,432	100.00	

of Denver, with no lode gold production, yielded more placer gold than San Juan County which ranks 6th in total lode gold production; and Adams County, in the plains just northeast of Denver, with no lode gold production, producing gold as a by-product from gravel washing plants, ranked next in placer gold production to Clear Creek County, 7th in rank of total lode gold production. Thirteen counties produced 98.53 per cent of the total placer gold for this period, while 24 counties yielded the remainder.

WPB Orders Curtail Placers in 1942

During 1942 lack of priority ratings, assigned by the War Production Board under order P-56, effective March 2, 1942, deprived virtually all gold mines in Colorado of essential equipment and supplies and forced many operators to close long before the Gold Mining Limitation Order of October 8, 1942, became effective. Large dredges managed to operate, however, until October 15, 1942, so that the drop in placer gold production from 1941 to 1942 was not as precipitous as it was from 1942 to 1943.

Table 7 shows the value of the small placer gold production in the state during 1943 and 1944. One-third of this was obtained as a by-product from gravel washing operations near Denver, while the remainder came from small hand operations in seven counties of the State. In 1944 placer gold production in Colorado reached its lowest point since mining began in Colorado in 1858.


$21,917,432
77 YEARS 100% OF TIME 100% OF VALUE
$7,201,638
HYDRAULICKING AND GROUND SLUICING
40 YEARS 51.9% OF TIME
32.9% OF VALUE
$8,526,023
BUCKET DREDGES
24 YEARS 31.2% OF TIME
38.9% OF VALUE
$6,159,531
DRY LAND, STACKER SCOW & BUCKET DREDGES
11 YEARS, 14.3% OF TIME
28.1% OF VALUE
$30,240
SLUICING. WORLD WAR
2 YEARS 2.6% OF TIME
0.1% OF VALUE
HUNDRED THOUSANDS OF DOLLARS
0 1 2 3 4 5 6 7 8 9 10 11
1870 1880 1890 1900 1910 1920 1930 1940 1944

COLORADO PLACER GOLD PRODUCTION—1858-1944

Total Production	1858-1944	86 years	Total Value...	$36,841,350	100% of time	100% of value
Flush production *	1858-1867	9 years	Value...	$14,923,918	10.5% of time	40.5% of value
Hydraulicking, groundsluicing	1868-1907	40 years	Value...	7,201,638	46.5% of time	19.6% of value
Bucket dredges	1908-1931	24 years	Value...	8,526,023	27.9% of time	23.1% of value
Dry land, scows, bucket dredges, etc.	1932-1942	11 years	Value...	6,159,531	12.8% of time	16.7% of value
Sluicing	1943-1944	2 years	Value...	30,240	2.3% of time	0.1% of value

* 1858-1867—Total Value of Production from Vein Outcrops and Small Scale Sluicing and Groundsluicing $14,923,918. Not segregated.

LEGEND

Increase in value of production due to increase in value of gold from $20.67 per oz. to $35.00 per oz.

Total production from 9 to 26 counties.

Gilpin County.

Jefferson County.

San Miguel County.

Summit County.

Moffat and Routt Counties.

Chaffee County.

Clear Creek County.

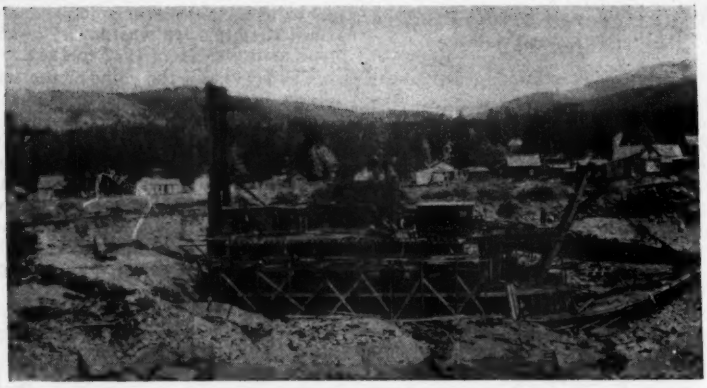
Park County.

Lake County.

The number of placer gold producing counties in Colorado is constantly increasing. While the production from the largest number of counties is as yet small, it points the way toward expansion of production on a larger scale.

1858-1867—Number of producing counties	6	1932-1942—Number of producing counties	37
1868-1907—Number of producing counties	17	1942-1944—Number of producing counties (World War)	8
1908-1931—Number of producing counties	22		

Since 1931 the increase in the price of gold, modern machinery requiring less initial capital investment for large scale placer mining, and better testing equipment and methods have removed most of the restrictions to the operation of medium size as well as large size placer deposits in Colorado.



An old timer. Traylor dredge at Breckenridge, resurrected in 1934; widened 9 feet; worked its way through town. Now idle

Table 8 gives a summary of gold and silver production from lodes and placers for the past nine years, as well as the methods of placer mining employed and their percentages of contribution. It shows that during these years more placer gold was produced by dry land dredges than by any other type of operation. However, during the latter part of the period, dragline floating and bucket dredges came to the fore, took over the lead, and will retain it at least for the immediate future.

Increased Output Now Seems Certain—New Operations Contemplated

The release at the end of the war from the Gold Mining Limitation Order came too late in 1945 to greatly affect placer mining in Colorado for that year. However, the South Park Dredging Company which operates the largest bucket dredge handling the largest yardage of any operation in the State, resumed operations at once. This is the only dredge in Colorado operating throughout the year without winter shut-downs. For 1945 production will therefore show a decided upward trend from its low in 1943 and 1944.

Many operations which were closed down during the war will no doubt resume activities in 1946. Among these are the 7½ cu. ft. dredge on Beaver Creek, Park County; the 10,000 cu. yd. floating dragline dredge on the Snowstorm placer and the 3,500 cu. yd. floating dragline dredge on Tarryall Creek near Como, both in Park County. A dry land dredge on one of the tributaries to the Arkansas River in Lake County may also get under way.

The above are established, proven operations. Besides these, new activities are contemplated. Although it probably has a 15 years reserve supply for its operating dredge, the South Park Dredging Company has acquired additional ground in Park County and may build a second large dredge for operations in Park County. The American Smelting and Refining Company, which heretofore had not been interested in placer mining in the state, is contemplating the testing of a large block of ground on the upper Arkansas River near Leadville, in Lake County. A large block of placer acreage in the Arkansas River Valley near Granite, Lake County, which ranks high in past production, has been assembled and purchased by Leadville mining interests in anticipation of renewed placer mining activities in the state.

All of the above operations and new activities are in two counties of the five, which so far have produced 90 per cent of Colorado's placer gold and which by no means are approaching exhaustion. In Summit County, which is credited with 47.8 per cent of the state's total placer gold production but where production has lagged on account of litigations (now settled), new activities should get under way along the Blue and Swan rivers and along French Creek where much unworked ground remains.

Many Inducements to Future Activities

The 29 counties which to date are credited with only 10 per cent of

TABLE 4

COLORADO. PLACER GOLD PRODUCTION. 1868-1907. BY COUNTIES
PERIOD OF HYDRAULICKING AND GROUNDSLUICING

1	Summit	$2,487,167		34.55%
2	Park	1,362,264	18.92%	53.47%
3	Chaffee	1,099,829	15.22%	68.69%
4	Lake	893,905	12.40%	81.09%
5	Clear Creek	738,920	10.23%	91.32%
6	Routt and Moffat	326,819	4.54%	95.86%
7	San Miguel	185,303	2.58%	98.44%
8	Jefferson	32,769	0.46%	98.90%
9	Montrose	23,176	0.32%	99.22%
10	Jackson and Larimer	16,025	0.22%	99.44%
11	Arapahoe	8,101	0.12%	99.56%
12	Rio Grande	7,000	0.10%	99.66%
13	Gunnison	5,000		
14	Miscellaneous	5,000		
15	Mesa	4,031		
16	Costilla	3,599	0.34%	100.00%
17	Douglas	2,712		
18	Grand	18		
		$7,201,638		

TABLE 5

COLORADO. PLACER GOLD PRODUCTION. 1908-1931. BY COUNTIES
PERIOD OF BUCKET DREDGES

1	Summit	$7,058,716	82.80%	82.80%
2	Lake	705,534	8.27%	91.07%
3	Park	543,538	5.27%	96.34%
4	Chaffee	72,261	0.85%	97.19%
5	Moffat and Routt	44,576	0.52%	97.71%
6	Costilla	24,892	0.29%	98.00%
7	Adams	22,835	0.27%	98.27%
8	Clear Creek	14,969	0.18%	98.45%
9	Gilpin	11,155	0.13%	98.58%
10	Gunnison	10,232	0.11%	98.69%
11	Montrose	6,766		
12	San Miguel	3,566		
13	Douglas	3,077		
14	Grand	1,336		
15	Eagle	758		
16	Denver	713		
17	Arapahoe	382	0.31%	100.00%
18	Teller	262		
19	Elbert	188		
20	Jefferson	133		
21	Ouray	106		
22	Mesa	28		
		$8,526,023		

TABLE 6

COLORADO. PLACER GOLD PRODUCTION. 1932-1942, INCLUSIVE. BY COUNTIES
PERIOD OF DRY LAND, DRAGLINE FLOATING, AND BUCKET DREDGES

1	Park	$2,737,032	44.44%	44.44%
2	Gilpin	1,224,237	19.88%	64.32%
3	Summit	924,110	15.00%	79.32%
4	Lake	436,851	7.09%	86.41%
5	Jefferson	310,637	5.04%	91.45%
6	Chaffee	94,488	1.53%	92.98%
7	Moffat	76,975	1.25%	94.23%
8	Boulder	71,963	1.17%	95.40%
9	Clear Creek	60,414	0.98%	96.38%
10	Adams	54,919	0.89%	97.27%
11	Montrose	46,345	0.75%	98.02%
12	San Miguel	17,274	0.28%	98.30%
13	Douglas	14,411	0.23%	98.53%
14	San Juan	13,161	0.21%	98.74%
15	Teller	11,880	0.19%	98.93%
16	Gunnison	9,645	0.16%	99.09%
17	Arapahoe	8,246	0.13%	99.22%
18	Denver	7,736	0.13%	99.35%
19	Routt	7,647	0.12%	99.47%
20	Eagle	7,089	0.12%	99.59%
21	Fremont	4,501	0.07%	99.66%
22	Ouray	4,193		
23	Elbert	3,795		
24	Costilla	3,773		
25	Jackson and Larimer	1,769		
26	Delta	1,384		
27	Grand	1,143		
28	LaPlata	1,082		
29	Mesa	1,007	0.34%	100.00%
30	Dolores	663		
31	Montezuma	500		
32	Pitkin	220		
33	Rio Grande	213		
34	Huerfano	132		
35	Rio Blanco	56		
36	Garfield	40		
		$6,159,531		

Colorado's placer gold production offer many inducements to future placer activities.

Based on an average of 91 per cent of the yardage worked in the state from 1939 to 1942, inclusive, the average values of placer gravel worked in Colorado during these years are as follows:

Year	Yardage	Per Cent of total Yardage Worked	Recovered Average Value in Cents Per Cu. Yd.
1939.....	2,430,964	87.0	24.86
1940.....	2,340,000	89.7	22.80
1941.....	5,322,300	93.8	18.74
1942.....	2,430,964	92.0	24.95
Total..	13,012,670	91.4	22.01

During 1941 the large dredge of the South Park Dredging Company, working on low value yardage, was a large contributor to above production and the average value per yard of gravel worked is therefore lower for that year.

Much of Colorado's future placer production will come from smaller dry land or floating scow and dragline operations. One of the latter, operating at a rate of 1,000 cu. yds. per day on a 75 acre tract during 1937-1939, has this production record. (See Table 9.)

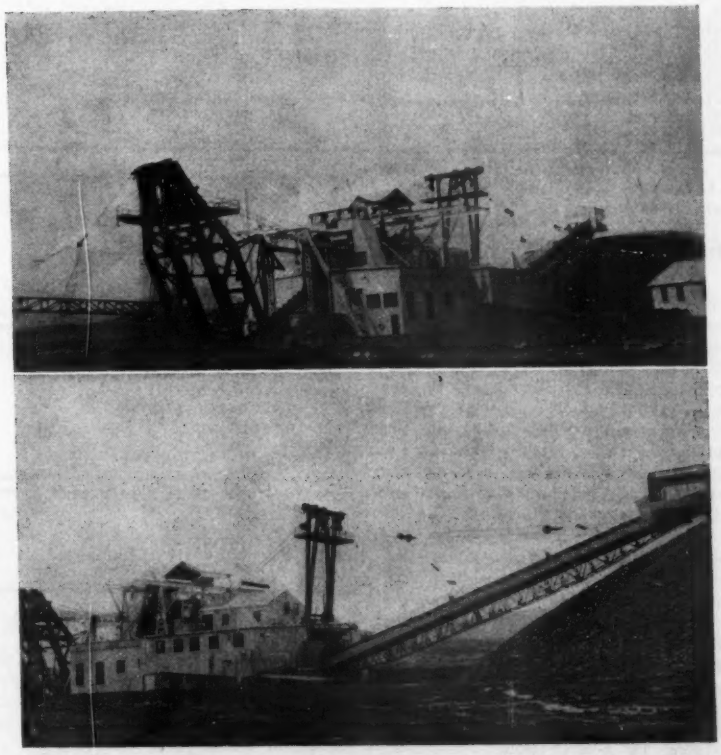
Operating costs for 1,000 to 4,000 cu. yds. per day in Colorado have varied from 10c to 20c per cu. yd., depending on local conditions. For large bucket dredges the operating costs were lower.

Small patches of rich placer ground may be available here and there in the State; they are the exceptions rather than the rule. However, many counties have placer mining potentialities for low grade yardage operations ranging from 1,000 cu. yds. per day upward.

100 Potential Placer Areas in West and Central Portions

There are over 100 potential placer areas distributed over the western and central counties of Colorado. Moffat and Routt Counties, which rank 7th in Colorado's placer gold production, have large potentialities. Apart from smaller placer areas, 150 miles of perennial stream valleys draining a 900 square mile area formerly occupied by a gold bearing outwash plain or alluvial fan, remain to be tested.

Among the 19 counties which so far produced less than 0.55 per cent of the State's total placer gold production there are many which upon further exploration, study and development, might produce large amounts of placer gold. Some of them are traversed by large streams known to contain placer gold; little or no thor-



12 cu. ft. dredge of South Park Dredging Co., working 2 miles south of Fairplay. Only year-round operation in state. Daily capacity 15-20,000 cu. yds. Largest dredge in Colorado

ough testing has as yet been done in their lowest alluvial plains.

Among the 47 gold producing counties of the State there are more than 20 in which immediate exploration, and possibly testing of individual placer deposits, is warranted.

All of the major streams draining the highly mineralized San Juan and adjoining mountains in Southwestern Colorado are known to carry placer gold, but they remain to be thoroughly and systematically tested. Along the eastern drainage system of the Colorado Rockies many placer deposits remain to be studied and tested.

TABLE 7

COLORADO. PLACER GOLD PRODUCTION. 1943-1944, INCLUSIVE. BY COUNTIES PERIOD OF WORLD WAR II. SMALL SCALE SLUICING AND GRAVEL WASHING

1	Adams	$9,485	31.37%	31.37%
2	Summit	7,875	26.04%	57.41%
3	Jefferson	5,005	16.55%	73.96%
4	Chaffee	4,795	15.86%	89.82%
5	Gilpin	2,240	7.41%	97.23%
6	Park	630	2.08%	99.31%
7	Clear Creek	105	0.35%	99.66%
8	Montrose	105	0.34%	100.00%
		$30,240		

TABLE 8

COLORADO. GOLD AND SILVER PRODUCTION. 1936-1944

Years	Mines Producing Lode	Mines Producing Plac.	Gold Lode Ounces	Gold Lode Dollars	Gold Placer Ounces	Gold Placer Dollars	Silver Lode Ounces	Silver Lode Dollars	Silver Placer Ozs.	Silver Placer Dlls.	Prices Per Oz. Gold Dollars	Prices Per Oz. Silver Dollars	Percentage of Gold Production Lode	Plac.	Tot.
1936	714	601	353,026	12,355,910	13,581	475,335	5,900,071	4,569,605	2,705	2,095	35.00	.7745	96.3	3.7	100
1937	655	490	354,034	12,391,190	14,871	520,485	6,258,128	4,840,662	2,565	1,984	35.00	.7735	96.0	4.0	100
1938	669	592	349,427	12,229,945	18,041	631,435	7,928,845	5,125,718	3,250	2,101	35.00	.64646464	95.1	4.9	100
1939	758	583	347,033	12,146,155	19,819	693,665	8,492,363	5,764,513	4,125	2,800	35.00	.67878787	94.6	5.4	100
1940	691	439	350,336	12,261,760	17,000	595,000	9,707,071	6,902,806	3,638	2,587	35.00	.71111111	95.4	4.6	100
1941	579	324	349,652	12,237,820	30,377	1,063,195	7,296,010	5,188,274	5,687	4,044	35.00	.71111111	92.0	8.0	100
1942	311	68	246,010	8,610,350	22,617	791,595	3,092,009	2,198,762	4,202	2,988	35.00	.71111111	91.6	8.4	100
1943	235	17	137,037	4,796,295	521	18,235	2,664,052	1,894,437	90	64	35.00	.71111111	99.6	0.4	100
1944	196	13	111,112	3,888,920	343	12,005	2,248,740	1,599,104	90	64	35.00	.71111111	99.7	0.3	100

COLORADO. PLACER GOLD PRODUCTION. 1936-1944

Year	Producing Placers	Ounces of Recovered Gold: Sluicing Hydraulicking	Drift Mining	Dredges: Dry-Land	Dredges: Floating Dragline	Dredges: Bucket Dredges	Total Ounces	Total Dollars	Percentage of Production: Sluicing Hydraulicking	Drift Mining	Dry-Land Dredges	Dragline Floating	Bucket Dredges	Total
1936	601	2,307.74	1,990.14	7,754.79	.....	1,528.33	13,581	475,335	17.0	14.5	57.2	....	11.3	100
1937	490	1,948.21	2,020.13	6,212.24	2,780.35	1,910.07	14,871	520,485	13.1	13.6	41.8	18.7	12.8	100
1938	592	2,285.00	1,362.00	10,201.00	3,166.00	1,027.00	18,041	631,435	12.6	7.6	56.6	17.5	5.7	100
1939	583	2,535.00	15.00	10,631.00	1,950.00	4,688.00	19,819	693,665	12.8	0.1	53.6	9.8	23.7	100
1940	439	1,822.00	.....	10,203.00	.....	4,975.00	17,000	595,000	10.7	....	60.0	....	29.3	100
1941	324	1,886.00	.....	13,052.00	4,817.00	10,622.00	30,377	1,063,195	6.3	....	43.0	15.8	34.9	100
1942	68	1,802.00	.....	119.00	6,173.00	14,523.00	22,617	791,595	8.0	....	0.5	27.3	64.2	100
1943	17	521.00	.....	.....	.....	.....	521	18,235	100.0	....	....	....	....	100
1944	13	343.00	.....	.....	.....	.....	343	12,005	100.0	....	....	....	....	100

Some Counties Produce More Placer Than Lode Gold

The seven Colorado counties which have produced more placer gold than lode gold are shown in Table 10.

Adams, Douglas, Arapahoe, Denver, Elbert and Rio Blanco are the six placer gold producing counties which have produced no lode gold. In the first five of these, much of the placer gold originates from conglomerate deposits by their erosion, disintegration and redeposition of the liberated gold in present stream channels. The conglomerate deposits themselves are made up of material eroded from the Rocky Mountains which at one time were twice as high as they are today.

Hinsdale, Conejos, Mineral, Custer, Saguache, Las Animas, Archuleta, Pueblo, Baca, and Alamosa counties, while credited with greater or lesser amounts of lode gold, have so far produced no placer gold. Potential placer areas should be present in Hinsdale and Conejos counties, and might also be found in Mineral, Custer, Saguache, Las Animas and Archuleta counties.

TABLE 9

1937	224,115 cu. yds.	Aver. value per cu. yd.,	38.37c (Recovered average)
1938	430,745 cu. yds.	Aver. value per cu. yd.,	25.60c (Recovered average)
1939	348,718 cu. yds.	Aver. value per cu. yd.,	19.57c (Recovered average)
	1,003,578 cu. yds.	Aver. value per cu. yd.,	26.40c (Recovered average)

TABLE 10

Costilla County	2 times as much placer gold as lode gold
Summit County	3 times as much placer gold as lode gold
Montrose County	3½ times as much placer gold as lode gold
Mesa County	5 times as much placer gold as lode gold
Jefferson County	10 times as much placer gold as lode gold
Moffat and Routt Counties	23½ times as much placer gold as lode gold

TABLE 11

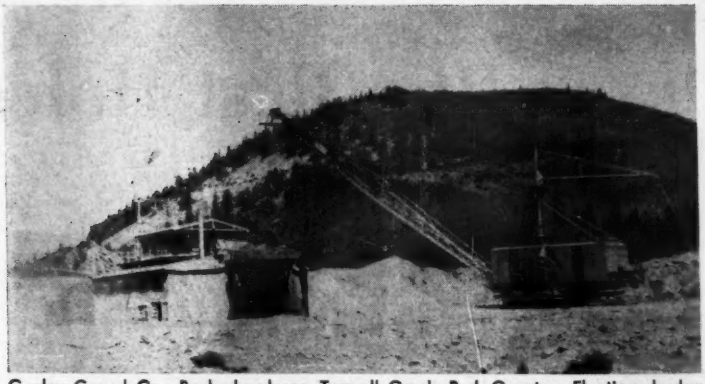
1868-1907—40 years—groundsluicing and hydraulicking	$180,041
1918-1931—24 years—large bucket dredges	355,251
1932-1942—11 years—dry land, floating scow, bucket dredges	550,886

From the sluicing and hydraulicking period, to the present time, the average annual value of Colorado's placer gold production has increased, as shown in Table 11.

These figures show that Colorado is not a "have-not" state when it comes to placer gold and that the fullest development and greatest production of its placer gold mining industry lies in the future rather than having been achieved during the past.

Factors Which Will Influence the Future

There are many factors which will influence the future of the industry.



Cooley Gravel Co., Peabody placer, Tarryall Creek, Park County. Floating dredge has spud, 60 ft. stacker, 30 in. belt, 40 x 5 ft. trommel. Dragline has 80 ft. boom, 3½ ft. bucket. All electric operation

It is hoped that the price level of newly mined gold will rise together with constantly increasing commodity, machinery, and labor prices. Stream pollution, which has been a hindrance to placer mining, can be avoided if plans are formulated prior to exploitation. Placer mining in Colorado has lately been carried on along stream channels which at the same time were used as conversion channels for water from the western to the eastern slope of the continental divide. The question of stream pollution was solved by cooperation between placer operators and Denver's water department and not by lawsuits.

Many engineers and geologists contend the gold in Colorado's stream valleys has been removed by glacial action long ago. This may be the case in some instances, but the opposite is also true, for placer gold has been and is being found in paying quantities in valleys formerly covered by more than 1,000 ft. of glacial ice. Much time has elapsed since the glacial periods in Colorado and erosion has continued since that time. A more careful study of the distribution of placer gold in the state is sorely needed in order to overcome prejudice. Gold still is where you find it.

The Mining Engineer Has a Real Place in Placer Mining

Since the 1931 revival of placer mining some laymen, individuals, road contracting firms, sand and gravel operators and others have gone into placer mining with the idea that all there is to placer mining is the ability to move dirt. The importance of thorough and honest investigation, mapping and proper sampling, which not only will determine average values and extent of workable deposits, but which should also determine the type of plant to be used for exploitation, is too often entirely overlooked. Many places can be successfully worked in Colorado if newcomers would realize that modern placer mining is not only a dirt moving operation, but a science and a business in which the placer mining engineer has his place.

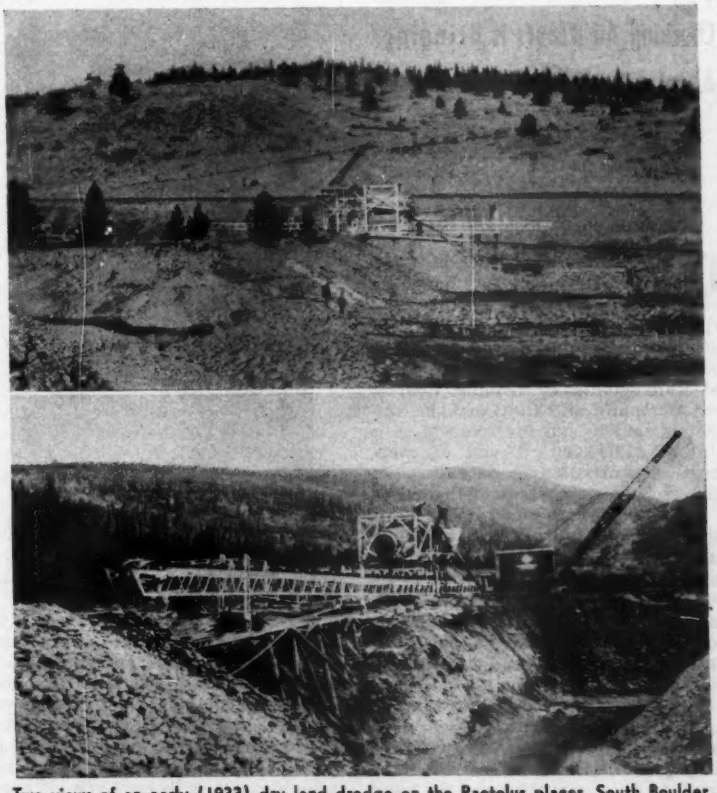
While lode mining machinery manufactured in Colorado is shipped all over the world, the Colorado placer miner still has to depend on California in order to obtain most of the proper testing and exploitation machinery and equipment. The design of any placer mining plant is the joint function of the examining engineer who has sampled and reported on a placer, and the manufacturer, whose designing engineers should keep abreast with existing successful placer mining machinery and its improvements in all parts of the country.

The True Needs of the Industry

Summing up these last factors which may influence the future of Colorado's placer mining industry, much depends on the proper coordination of and cooperation between the prospector, the theorist, the field geologist, the placer engineer, the man with the ability to move dirt, and the manufacturer of mining machinery and equipment. Each must be willing to give, as well as to take.

Last but not least, the future of Colorado's placer mining industry depends on the availability of venture capital which must be willing to assume the risks involved in testing potential placer deposits and which naturally looks forward to a fair profit. While the excess profits tax remains, little, if any, venture capital will be available.

The future of Colorado's placer mining industry is indeed bright and, reviving from its suppression during World War II, will take on new life and contribute its share toward the creation of new, untarnished wealth.



Two views of an early (1933) dry land dredge on the Pactolus placer, South Boulder Creek, Gilpin County

Holes are loaded under close supervision and according to plan

Big Blast Holes at Beechwood

Bigger Holes Show Many Advantages. Care in Planning and Checking All Blasts is Bringing About Improvement in Breakage

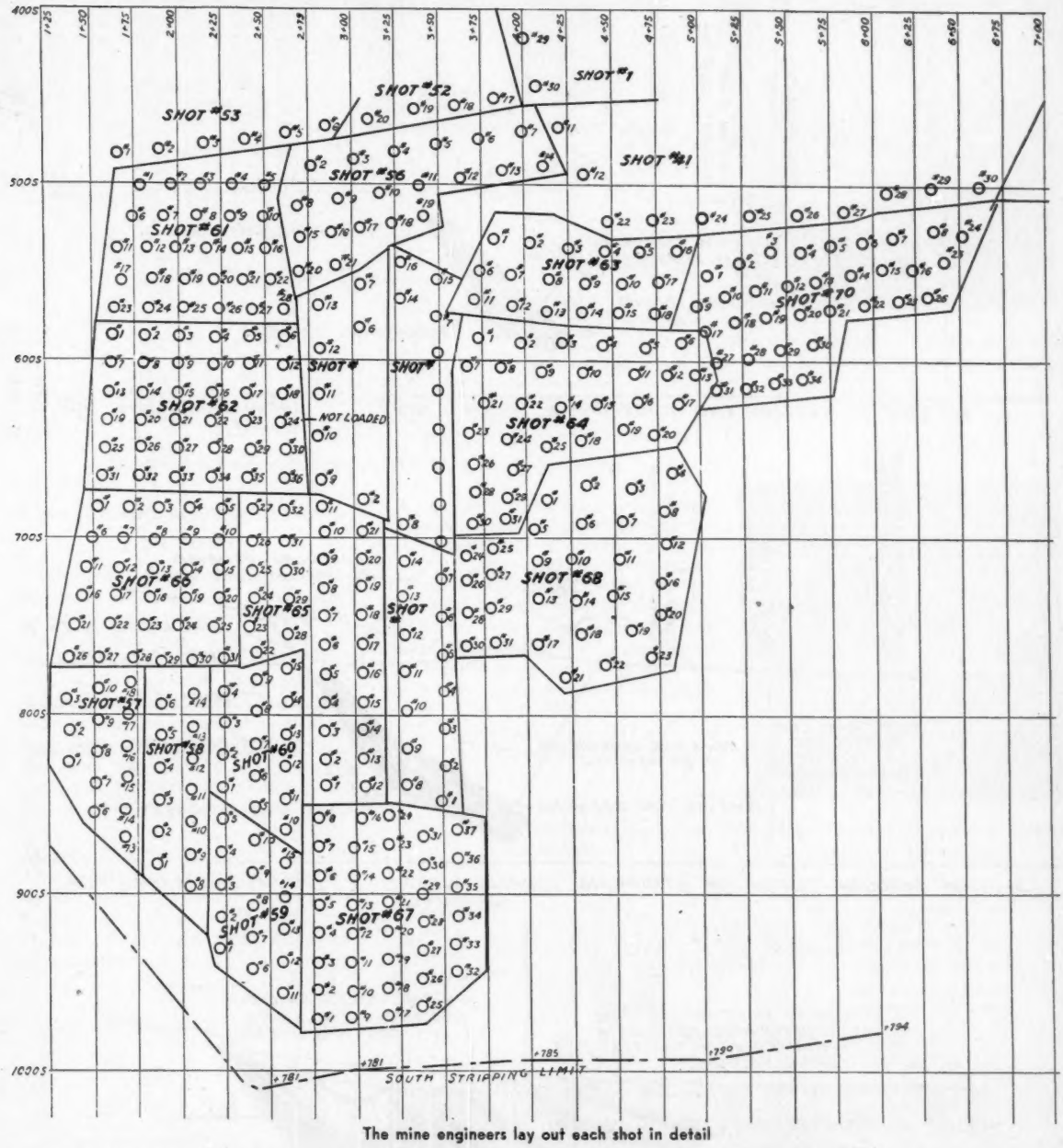
Three drills at work in massive rock in an area to be moved by power shovel. Note 25-yard dragline working back the high bank of cast material

THE Correale Construction Company, of Hazelton, Pa., has been getting some noteworthy results in its drilling and blasting practice at the Beechwood stripping near Minersville, Pa. This operation is on property of the Philadelphia & Reading Coal & Iron Company and the Correale contract is said to call for removal of a total of 11,000,000 cu. yds. of overburden from the Mammoth anthracite vein. A large percentage of this cover is rock, including some very hard sandstone. Its proper and economic breakage is an important factor in the success of the undertaking.

Excavation began in August 1943, employing at the start a 14-cu. yd. Monighan walking dragline which the contractor had purchased in Nevada. This was followed in 1944 by an 1150-B 25-yd. Bucyrus-Erie walking dragline equipped with heavy duty operating motors and a 180-ft. boom. Walking draglines are especially suited to this operation as the machines employed here must do most of their work from positions on cast ground. While actual yardage in place amounts to 11,000,000 it is estimated that 28,000,000 cu. yds. will be moved because of necessary re-handling. Thus in mining the 4,000,000 tons of raw coal to be made available, the stripping ratio will be 7 yds. of overburden to 1 ton of coal.

Number of Working Benches Kept at a Minimum

Big draglines of the type used are well suited to handling rock, with emphasis on the fact that results are improved if the rock is well broken. The number of working benches in the overall plan is kept at a minimum



The mine engineers lay out each shot in detail

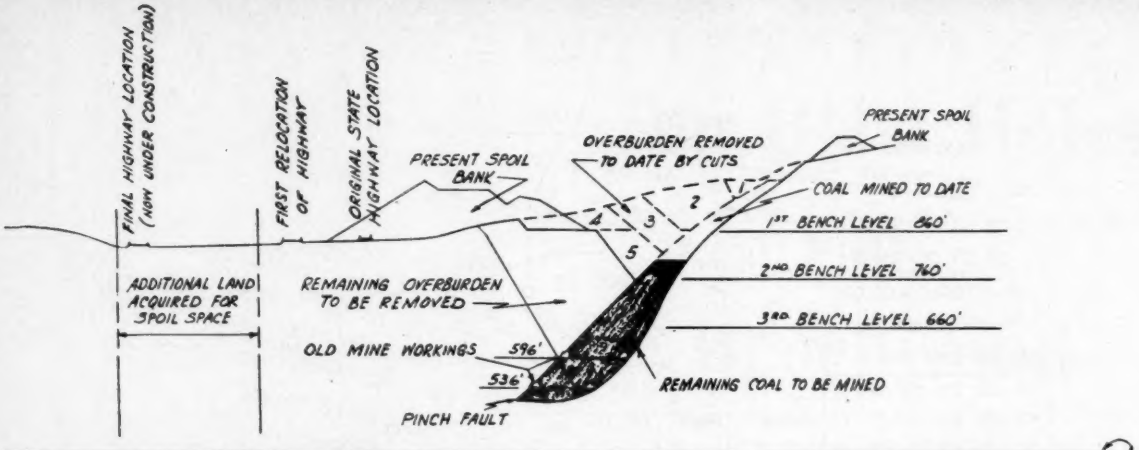
in order to eliminate as many moves as possible. Digging depths on bench heights with these machines are set at 100 to 120 ft. which means holes of 115 to 135 ft. depths for blasting purposes. The maximum depth of overburden is 340 ft. below the original surface.

The whole operation proceeds in accordance with carefully laid plans. All moves are outlined ahead of time and close schedules followed to bring about smooth coordination. Ramps must be planned for maneuvering from operating levels 100 to 200 ft. below surface to the tops of spoil piles over 200 ft. above it.

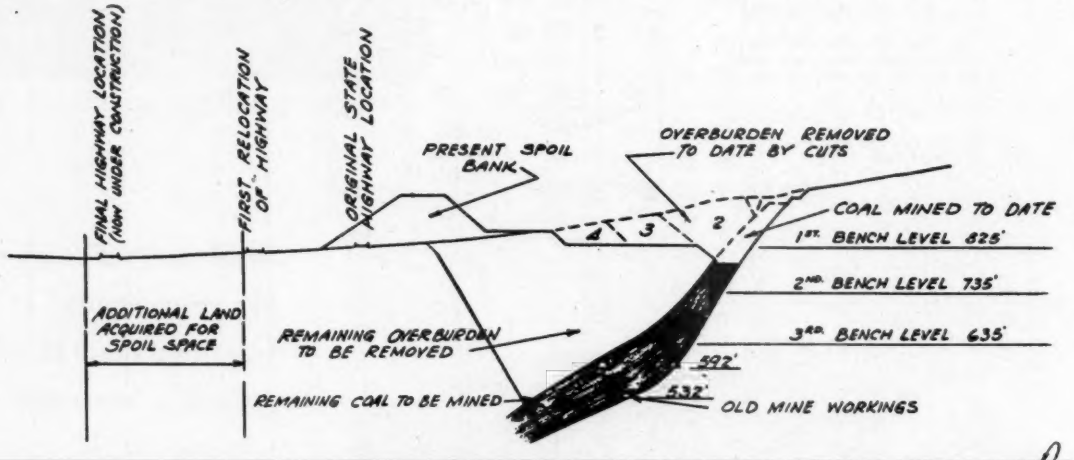
Part of Overburden Moved by 5-Yd. Shovel

A portion of the overburden is being moved by a 120-B electric shovel with 5-yd. bucket. Rock is loaded into 15-ton Euclid trucks which haul it out of the pit up an 8 per cent road grade and deposit it on a dump outside the stripping limits. This feature was introduced for working those areas of the stripping where confined space limits the use of draglines for rehandling overburden. Drilling for this operation averages around 35 ft. in depth preparatory to 25 to 30 ft. cuts by the shovel. Meticulous care in this phase of the drilling and blasting work is of importance equal to that of getting ready for the draglines.

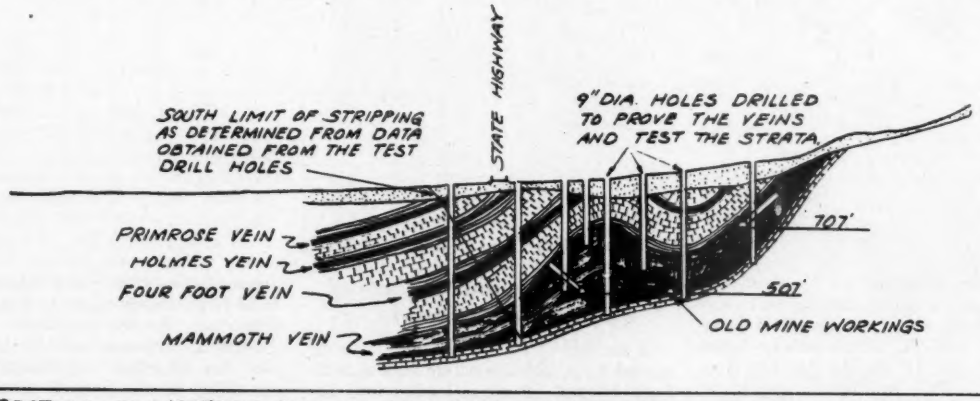
Such a program calls in the aggregate for effective rock blasting without delay to the overall schedule. A uniform digging floor is essential as this must later serve as the working level for the next bench below. Rock lying at the bottom of the cut and at the extreme working limits of the dragline must be well shattered to permit easy filling of the bucket. Good blasting means greater yardage per move and per unit of time with reduced duty on equipment—all of which makes for lowered operating costs.



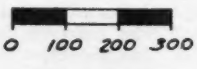
SECTION AT EASTERN END OF STRIPPING LOOKING WEST DATUM - 400' ABOVE TIDE



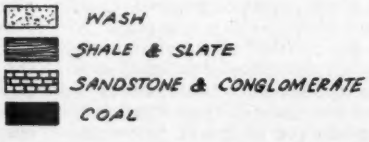
SECTION THROUGH CENTER OF STRIPPING LOOKING WEST DATUM - 400' ABOVE TIDE

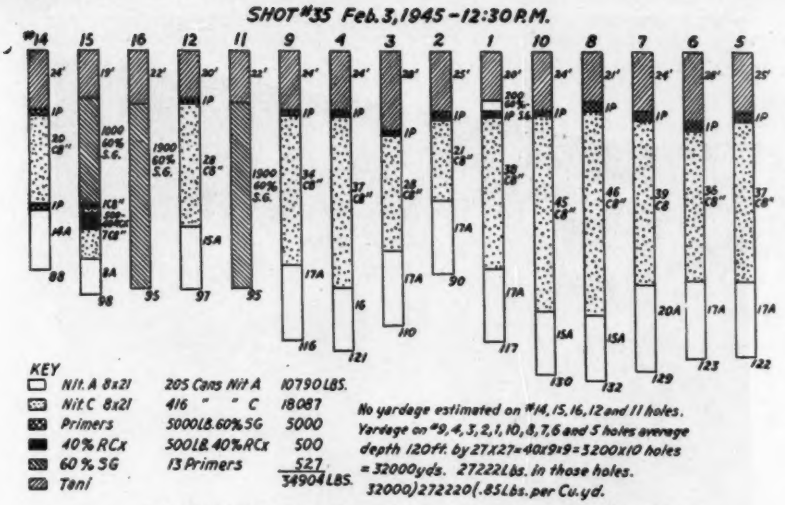

STATE HIGHWAY
SOUTH LIMIT OF STRIPPING AS DETERMINED FROM DATA OBTAINED FROM THE TEST DRILL HOLES
9" DIA. HOLES DRILLED TO PROVE THE VEINS AND TEST THE STRATA
PRIMROSE VEIN
HOLMES VEIN
FOUR FOOT VEIN
MAMMOTH VEIN
707'
507'
OLD MINE WORKINGS

SECTION AT WESTERN END OF STRIPPING LOOKING WEST DATUM - 400' ABOVE TIDE



SCALE - FEET




SHOT #35 Feb. 3, 1945 - 12:30 P.M.
#14 15 16 12 11 9 4 3 2 1 10 8 7 6 5
KEY
Nit. A 8x21
Nit. C 8x21
Primers
40% RCx
60% SG
Toni
205 Cans Nit A 10790 LBS.
416 " " C 18087
500 LB. 60% SG 5000
500 LB. 40% RCx 500
13 Primers 527
34904 LBS.
No yardage estimated on #14, 15, 16, 12 and 11 holes.
Yardage on #9, 4, 3, 2, 1, 10, 8, 7, 6 and 5 holes average depth 120 ft. by 27 X 27 = 40 x 9 x 9 = 3200 x 10 holes = 32000 yds. 272222 Lbs. in those holes.
32000) 272220 (.85 Lbs. per Cu. yd.

Selected shot showing the problems involved in deep hole blasting

The information obtained by the driller is the basis for planning the subsequent blast

Close Cooperation of Technical Staffs

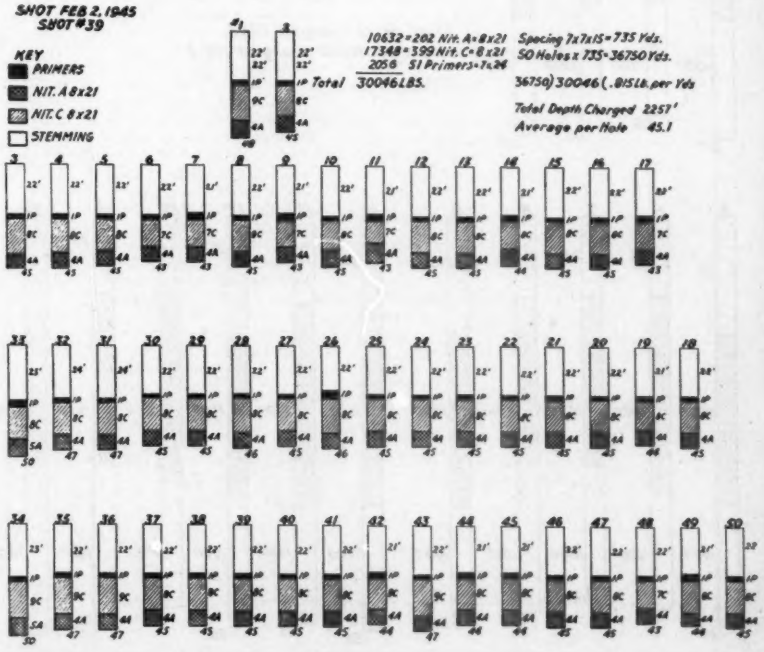
In order to obtain the best possible results in meeting these blasting requirements, the technical staff of the Du Pont Company's Explosive Department works in close collaboration with the engineering and operating staffs of the contractor. Depth and spacing of holes, type and quantity of blasting material, its distribution in the holes and method of detonation have now been pretty well determined for the variety of conditions being met.

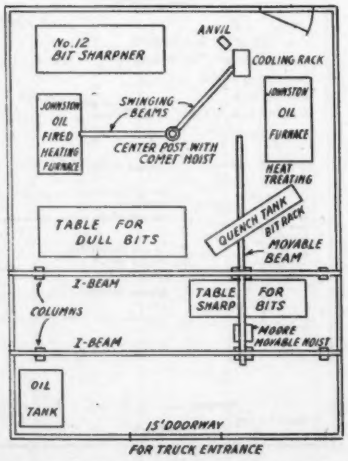
Each blast is carefully planned. Before drilling, all holes are staked out by the engineers and their required depths determined. Through uniformity of spacing the drilling is kept at a minimum.

A record of the rock strata encountered is kept by the driller as the drilling proceeds. He keeps track of small overlying coal veins, openings or broken areas left by earlier underground operations and notes the hardness of the rock. This information is plotted and arranged on special forms and cross-sections are made to show the relative positions of the various strata. With this clear picture of subsurface conditions, charges can be placed for the greatest possible blasting efficiency.

The 8-inch cartridge is lowered into hole with small portable windlass

Below: Selected shot showing data on a shallow blast





The drill-sharpening shop is laid out for efficiency and convenience

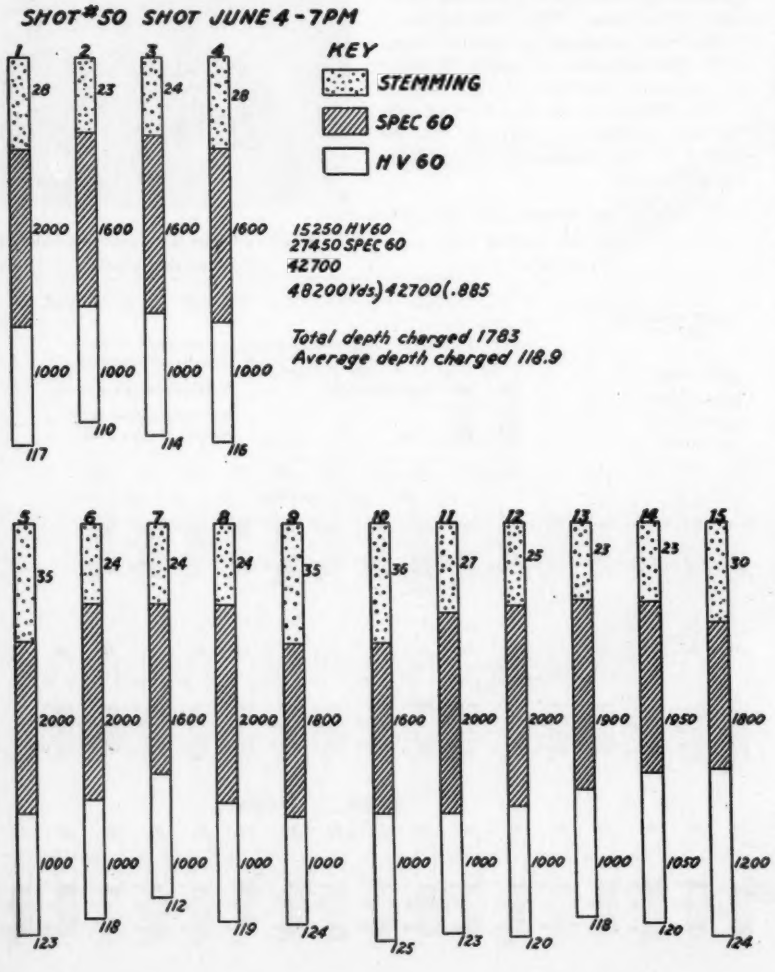
Heavy Drilling Equipment is in Use

The churn drills employed are model 42-T, drilling 9-in. holes. One Diesel driven drill and five electric drills are in use at Beechwood. To date these machines have drilled over 32 miles of the estimated total of 94 miles of drilling which must be done to complete the job.

These 9-in. drills use a string of tools consisting of bit and stem weighing 4,800 to 5,000 lbs. Plain carbon steel bits are used but some experimental work is being done with alloy steel bits. Bit sharpening crew consists of blacksmith and two helpers. A modern, well laid out shop (see sketch) operates one shift a day to handle the necessary sharpening and shaping. During summer they usually work on the cool afternoon shift.

Drillers find that the big bits cut through the hardest ground without great difficulty. Footage per sharpening varies from about 15 ft. in the hard sandstone to 60 and 70 ft. in the softest formations drilled. While the 9-in. drill has proved advantageous over smaller sizes in this district, the Correale management is planning on using a still larger (12-in.) bit. A heavier set of tools is being fitted to one of the 42-T drills to test the feasibility of using 12-in. holes. The 9-in. have saved footage over the smaller drills formerly used in the district by permitting wider spacing, and the heavier string of tools has helped increase the drilling rate. Part of the increase is due also to the larger bit's ability to pass through broken ground less hampered by cracks and fissures.

Waste rock from the 5-yard shovel operation is hauled over 8 per cent grades by 15-ton Euclid trucks



CORREALE CONSTRUCTION CO.
HAZLETON, PA.

DRILL OPERATORS
DAILY REPORT

Drill No. 26 Date 8/1/45
Driller George Connors Job No.
Helper Jimmie Frankenstein Shift 1
Hours Drilling 5¼
Hours Repairing
Hours Delayed 2 hrs-Pulling Cable in Coal Pit Cause
Hours Worked 7¼

Hole No.	Depth in Ft.	Amount Drilled 33 Lin. Ft
1. 14	31	
2.		No. of Bits Used
3.	25'-31'	MSS Repairs Made
4.		
5. 6		7-13 Broken
6.		13-21 MSS
7.		21-27 MSS
8.		Repairs Needed
9.		
10.		

Approved Foreman

C-32A 2M 4-45 LAL

The drillers keep a complete record of all formations encountered

In the driller's words, "we're surer of getting down."

Bits are transported to and from the drills by truck and can usually be delivered very close to operations. Electric power for the five drills is supplied by power cable from two 125 Kva substations in the pit. Drills operate on 440 volts. Water for drilling purposes is supplied by a 2-in. water line from a large portable tank usually spotted on a bank well above the drills.

Nitramon Employed to Advantage

Well over 2,700,000 lbs. of explosives have been used so far in blasting the overburden. The largest single shot to date used 131,000 lbs. of explosives, most of which was Dupont "Nitramon." This contracting firm is giving first choice to this particular blasting agent (under suitable hole conditions) due to its safety, its high-shattering action and highly satisfactory economy in use. Some dynamite is re-

BEECHWOOD STRIPPING—SHOT NO. 68

RECORD OF YARDAGE BLASTED

Section 3+52E	0				
+66E	2800 sq. ft.	1400 sq. ft.	14′	19,600 cu. ft.
+79E	2850 sq. ft.	2825 sq. ft.	13′	36,725 cu. ft.
4+07E	5880 sq. ft.	4365 sq. ft.	28′	122,220 cu. ft.
+27E	8120 sq. ft.	7000 sq. ft.	20′	140,000 cu. ft.
+50E	7800 sq. ft.	7960 sq. ft.	23′	183,080 cu. ft.
+77E	8450 sq. ft.	8125 sq. ft.	27′	219,375 cu. ft.
5+00E	0 sq. ft.	4225 sq. ft.	23′	97,175 cu. ft.
				818,175 cu. ft.
				30,303 cu. yd.

$$\frac{21{,}735\ \#\ \text{Explosives used}}{30{,}303\ \text{cu. yds. Solid}} = 0.717\ \#\ \text{per cu. yd.}$$

General Notes: Shot fired by DuPont Explosive Company July 31, 1945 at 12:14 P.M.
31 holes, average depth 58.5′
Spacing 21′ x 25′ using
6,473.49 # Nitramon A—8″
14,087.52 # Nitramon C—7½″
1,174.50 # Nitramon Primers
21,735 # Total

Fragmentation good

No phase of the work is considered of greater value than good records

DRILL HOLE RECORD BEECHWOOD STRIPPING SHOT Nº 68

DRILL HOLE No.	ELEVATION TOP OF HOLE	DEPTH DRILLED FEET	DEPTH CHARGED FEET	FEET LOST	CHARGE POUNDS	LOG OF HOLE
1	791	61	60	1	782	0-50 Med. Sandstone 50-61 Med. Rock
2	793	64	63	1	912	0-64 Med Rock
3	795	65	62	3	956	0-12 Broken 12-55 Med. Sandstone 55-65 Med. Rock
4	797	67	59	8	782	0-20 Broken 20-67 Med Sandstone
5	789	60	57	3	739	0-40 Med. Rock 20-60 Med. Sandstone
6	794	66	66	—	956	0-66 Med. Sandstone
7	796	67	67	—	1000	0-67 Med. Sandstone
8	795	67	55	12′	695	0-67 Broken ——*1
9	788	59	59	—	782	0-59 Med. Sandstone
10	793	66	66	—	912	0-30 Med Sandstone 30-35 Slate 35-55 Med S.S. 55-60 Broken 60-66 Med SS
11	796	66	65	1	956	0-66 Med. Sandstone
12	798	68	67	1	1000	0-60 Med. Rock 60-68 Med. Sandstone
13	786	57	57	—	695	0-57 Med. Sandstone
14	792	62	60	2	869	0-25 M.S.S. 25-31 Shale 31-36 Coal 36-45 M.S.S. 45-60 M.S.S. 60-62 Brkn.
15	796	66	64	2	869	0-28 M.S.S. 28-31 Shale 31-66 Med. Sandstone
16	797	69	67	2	956	0-30 M.S.S. 30-37 Shale 37-69 M.S.S.
17	786	57	57	—	739	0-57 Med. Sandstone
18	791	61	59	2	869	0-61 Med Sandstone
19	795	65	65	—	912	0-65 Med. Sandstone
20	799	69	68	1	956	0-69 Med. Sandstone
21	788	60	59	1	869	0-50 Med Sandstone 50-60 Med Rock
22	792	62	55	7	695	0-53 Med. Sandstone 50-62 Hard Sandstone
23	798	68	66	2	912	0-68 Med. Sandstone
24	768	38	Caved	38	—	0-38 Med Sandstone Broken + caving —*2
25	768	38	37	1	320	0-7 Slate 7-38 Med Sandstone
26	768	38	Caved	38	—	0-38 Broken + caving —*3
27	768	38	38	—	300	0-38 Med. Sandstone
28	768	40	37	3	257	0-40 Broken
29	768	38	37	1	319	0-38 Med Rock
30	768	38	38	—	363	0-10 Fill 10-15 slate 15-30 Med. Sandstone 30-38 Broken
31	768	40	40	—	363	0-40 Broken
						NOTE *1 Hit an opening at 67′ Plugged hole at 57′ *2 Hole caved *3 Hole caved
		1780	1650	130	21,735	

quired, however, and is used under certain circumstances.

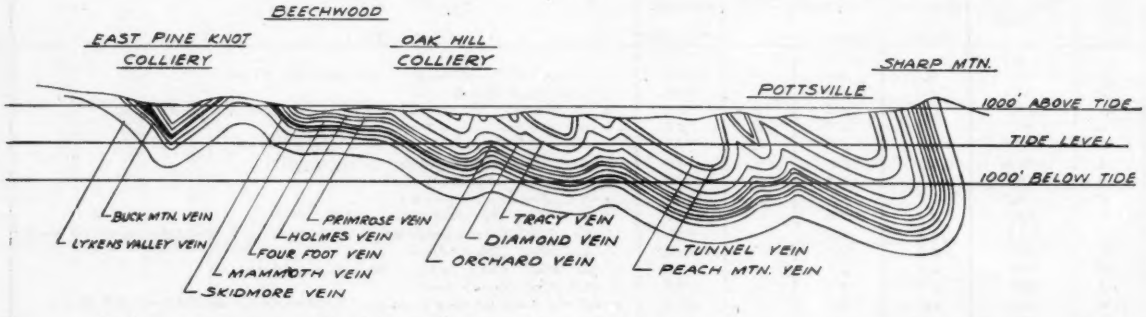
In areas where the material is badly cracked due to settlement of old mine workings below, the drills often encounter pockets and caves and holes are likely to have rough walls. In such cases a gelatin-type explosive is desirable as the cans of Nitramon are not well adapted to such conditions. Hi-velocity Gelatin has been found best in meeting the requirements of high heads of water and long periods of exposure.

Each Blast is Carefully Planned and Checked

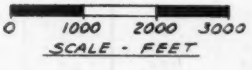
The accompanying cross-sections, map and drill hole records show the precision with which this operation is conducted. From the initial staking out of the holes, through the driller's care in keeping his record straight and the thoughtful planning of each blast, full attention to usable details is noted. The idea is to avoid leaving anything to chance or guesswork, and complete engineering control has proved justifiable.

Burden on each hole is determined and loading is controlled as illustrated in the blast diagrams herewith. In

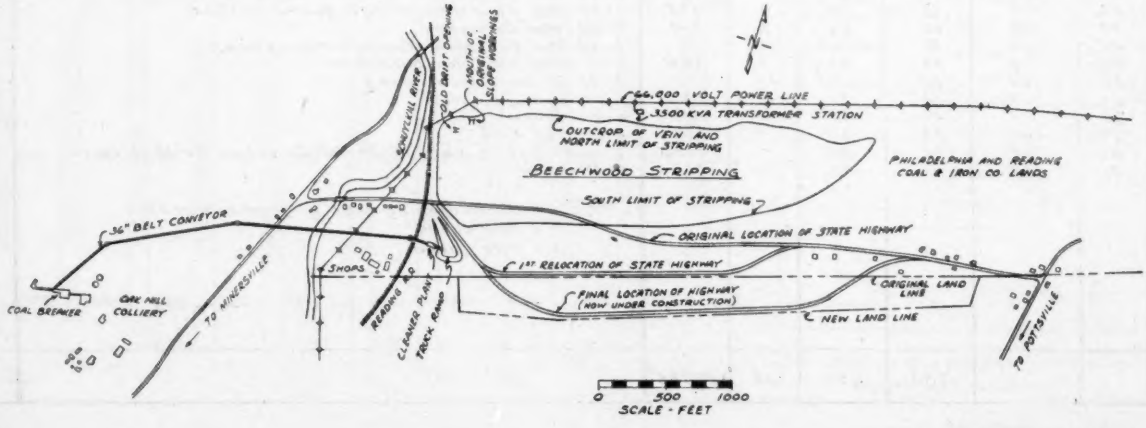
Two of the big 9-inch drills which have so materially aided Beechwood's digging problem. Note water tank above and explosives truck to right



Above: General section, vicinity of Beechwood



Below: General plan of Beechwood operation

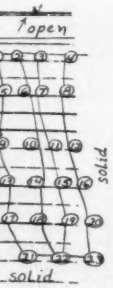


REPORT OF STRIPPING BLAST

Company Correale Construction Company — Reported by Theodore Reich

Location Beechwood — Date Blast Made 7-31-45

Shot #68

Hole	Depth	Burden	Centers	"Nit" A 8 x 21 Lbs. of $	"Nit" A 8 x 21 Tamping Ft	"Nit" C 7½ x 24 Lbs. of $	"Nit" C 7½ x 24 Tamping Ft	Primers 7 x 24 Lbs. of $	Primers 7 x 24 Tamping Ft	Remarks
1	60'	21'	27'	5		11		1	27'	
2	63'	21'	27'	5		14		1	23'	
3	62'	21'	27'	5		15		1	23'	
4	59'	21'	27'	5		11		1	27'	
5	57'	21'	27'	5		10		1	26'	
6	66'	21'	27'	5		15		1	25'	
7	67'	21'	27'	5		16		1	24'	
8	55'	21'	27'	5		9		1	26'	
9	59'	21'	27'	5		11		1	27'	
10	66'	21'	27'	5		14		1	25'	
11	65'	21'	27'	5		15		1	23'	
12	67'	21'	27'	5		16		1	25'	
13	57'	21'	27'	5		9		1	28'	
14	60'	21'	27'	5		13		1	24'	
15	64'	21'	27'	5		13		1	25'	
16	67'	21'	27'	5		15		1	27'	
17	57'	21'	27'	5		10		1	27'	
18	59'	21'	27'	5		13		1	22'	
19	65'	21'	27'	5		14		1	25'	
20	68'	21'	27'	5		15		1	27'	
21	59'	21'	27'	5		13		1	22'	
22	55'	21'	27'	5		9		1	25'	
23	66'	21'	27'	5		14		1	25'	
24	---	caved ---								
25	37'	16'	18'	2		4		1	21'	

Estimated Cu. Yds. _____ Total Explosives _____ lbs. Cu.Yd.per Lb. _____

Feet Primacord _____ No.Elec.Blstg.Caps _____

Started Loading _____ Finished Loading _____ Blast fired _____

Seismograph Data: _____

Use reverse side of this sheet for general remarks.

REPORT OF STRIPPING BLAST

Company Correale Construction Company — Reported by Theodore Reich

Location Beechwood — Date Blast Made 7-31-45

Shot #68

Hole	Depth	Burden	Centers	"Nit" A 8 x 21 Lbs. of $	"Nit" A 8 x 21 Tamping Ft	"Nit" C 7½ x 24 Lbs. of $	"Nit" C 7½ x 24 Tamping Ft	Primers 7 x 24 Lbs. of $	Primers 7 x 24 Tamping Ft	Remarks
26 1	---	caved	---							
27 2	38'	16'	18'	0		6		1	27'	
28 3	37'	16'	18'	0		5		1	25'	
29 4	37'	16'	18'	2		4		1	22'	
30 5	38'	16'	18'	2		5		1	27'	
31 6	40'	16'	18'	2		5		1	25'	
7										
8										
9										
10										
11				123 cans "Nitromon" A (8 x 21)				6473.49#		52 63
12				324 cans "Nitromon" C (7½ x 24)				14857.52#		43 48
13				29 Primers (7 x 24)				1174.50#		40 50
14								Total--- 21735.51#		
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										Lbs per Cu Yd .686

Estimated Cu. Yds. 31,688 Total Explosives 21,735 lbs. ~~Explosives~~ lb. _____

Feet Primacord 2000 wire pound 1000 reinforced No.Elec.Blstg.Caps Cap & Fuse

Started Loading 7-28-45 10:30 a.m. Finished Loading 7-31-45 10:30 a.m. Blast fired 7-31-45 12:14 p.m.

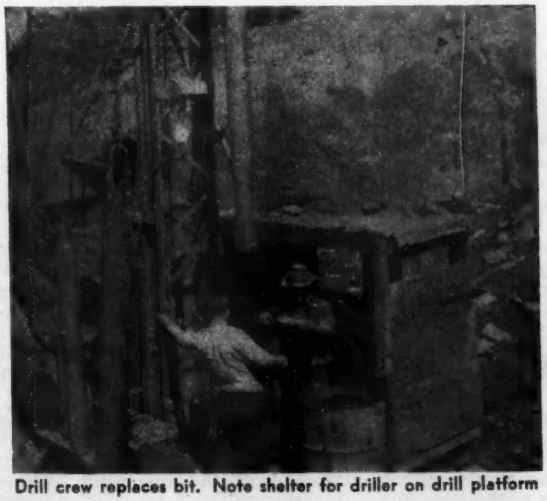
Seismograph Data: Holes #25 & #26 caved, not loaded. Hole #6 had opening blocked to 55 ft. Shot looked good.

Use reverse side of this sheet for general remarks.

Note complete report even to diagram showing order of hole rotation in blast

this manner, explosive can be placed where most effective. Rotation (sequence of setting off the holes) is very important. In one case it was noted that a hard ridge remained down the center of the area after blasting. This was due to failure to so arrange the rotation of holes as to produce a series of short slices starting at the unburdened end of the shot. Subsequent blasts benefited from this occurrence but this instance is illustrative of the value to be found in keeping careful records and exercising all reasonable precautions in the full series of operations having to do with a blast. From the plan diagram of holes appearing on the blasting sheet, one can determine the order of firing employed and judge unsatisfactory results.

Big blast hole drilling with the 9-in. drill is now in extensive use in strip mining in the anthracite field. The Correale staff is firmly convinced of its many advantages and is looking confidently to further improvements with still larger drills. The overall results being obtained at the Beechwood stripping are in large measure attributable to the use of larger drilling equipment and to the careful control over blasting procedure.



Drill crew replaces bit. Note shelter for driller on drill platform

Secondary blasting is sometimes necessary. For this purpose portable drill and compressor are employed

Anaconda's Tree Farms

This area cut over in 1885-86 and heavily grazed for many years. Almost a pure ponderosa pine stand. Area well protected from fire

Tree Farm System Assures Adequate Timber Supply for Life of the Company's Mines

By HAROLD OLSON
American Forest Products Industries, Inc.

WHEN the Anaconda Copper Mining Company recently set up four big western Montana tree farms totaling 331,000 acres, many people may have wondered what this great industrial firm was doing in the timber business. But to western folk it was no enigma; Montanans especially know that mining and timber go hand in hand. Even as the mine stands behind the fighting man so does the forest stand behind the mine. Timber is a vital tool of mining. The two are inseparable.

Western Montana's forests have been part of Butte mining ever since digging first started in the fabulous hill three-quarters of a century ago. The mines have drawn on the forests for prodigious amounts of timber and yet western Montana today is a land of green, with great forests clothing the long slopes that stretch as far as the eye can reach. Virgin forest is still there in quantity, and where the old growth has been harvested the new forest is generally deep and lovely. Renewing itself as it goes along meeting man's needs, the Montana forest marches hand in hand with the State's destiny.

Assurance of "Long Pull" Supply

Anaconda Copper Mining Company has been a forest products operator on a large scale for more than 50 years. It is one of the State's major private owners of forest land and it is common knowledge in Montana that the company has never allowed an acre of land to default for taxes. Mining, however, is Anaconda's first and primary consideration; the forests make deep mining possible.

So, when this world-famed mining firm entered the tree farm program early in 1945, forestry circles were pleased but not surprised. The American Tree Farm System is the symbol of good forest practices aiming for continuous production of wood by growing trees for tomorrow.

Marcus Daly made plans long ago to protect the mines with timber by assuring a long-pull supply. Before the end of the nineteenth century Anaconda rooted its timber enter-

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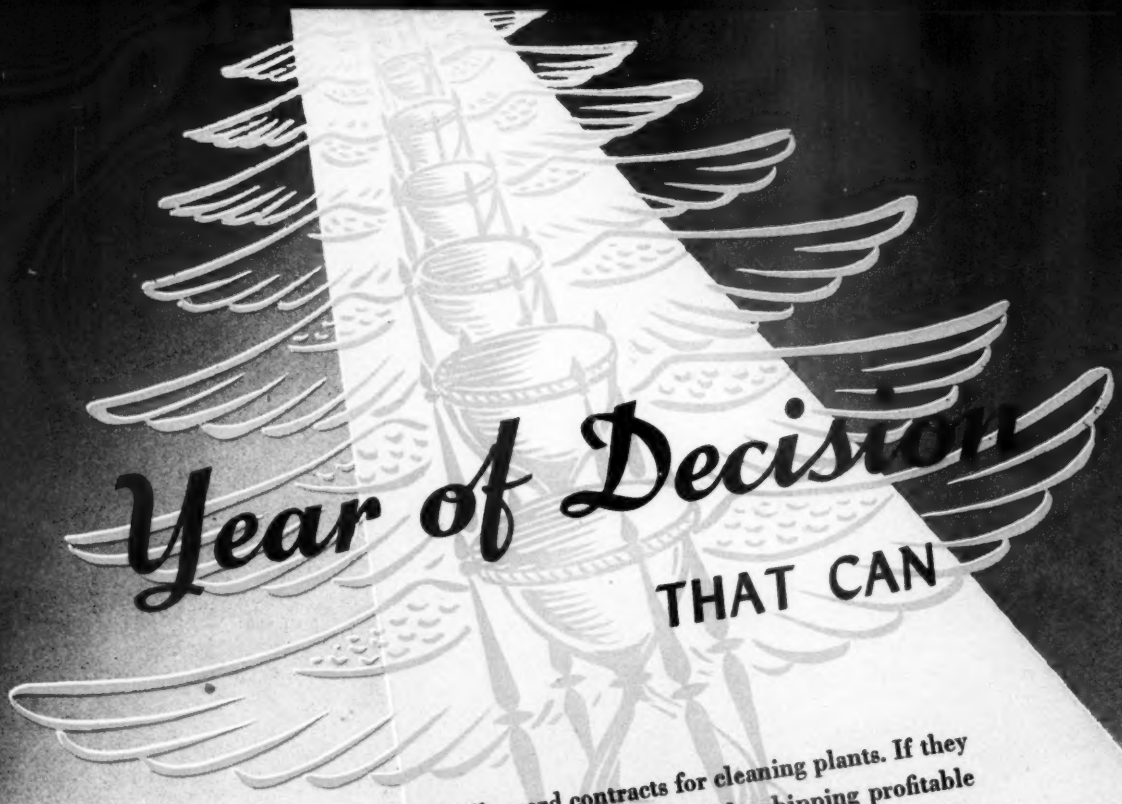

Year of Decision

THAT CAN

In 1946 many mines will award contracts for cleaning plants. If they test wisely and choose well, these mines will be shipping profitable premium-grade metallurgical, steam or domestic coal long after this period of unprecedented demand has passed.

But time is running out, as each new coal preparation plant gets under construction or under way. 1946 is the YEAR OF DECISION . . . for the days when the nation's shelves and bins will be full and competition again becomes keener.

We believe Heavy-Media Separation has marked advantages over previous preparation methods, particularly in treating coal with a high-percentage of near-gravity material, with high and variable percentage of refuse and where the feed must be cleaned at a wider range of gravities . . . both higher or lower . . . than previous processes.

Our beliefs are based on these simple facts:

Heavy-Media Separation operates at equal efficiency of separation on any fragmentary materials requiring separation based on specific gravity differences in the range of 1.25 to 3.40. It makes a sharp, uniform separation at the desired gravity . . . which can be maintained continuously within ± 0.01, or quickly and easily changed to suit varying characteristics of the feed coal.

AMERICAN CYANAMID COMPANY

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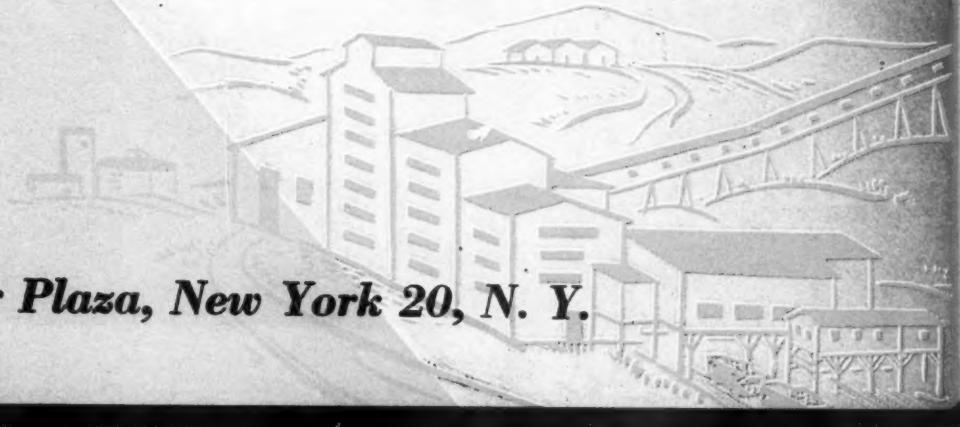
Heavy-Media Separation plants can be designed for multiple-product separation from run-of-mine feed in a full size-range to meet any present or future standard in any coal market. By continuous reclamation, loss of the low-cost medium is negligible. Plants can be started or shut down without bank-loss of coal or medium or plant efficiency. Equipment is standard and proved by years of operation.

These are the facts, exactly as we know them . . . confirmed by testing carload lots from the mines of a substantial number of leading coal producers . . . accepted as the basis for Heavy-Media Separation cleaning plants now being designed.

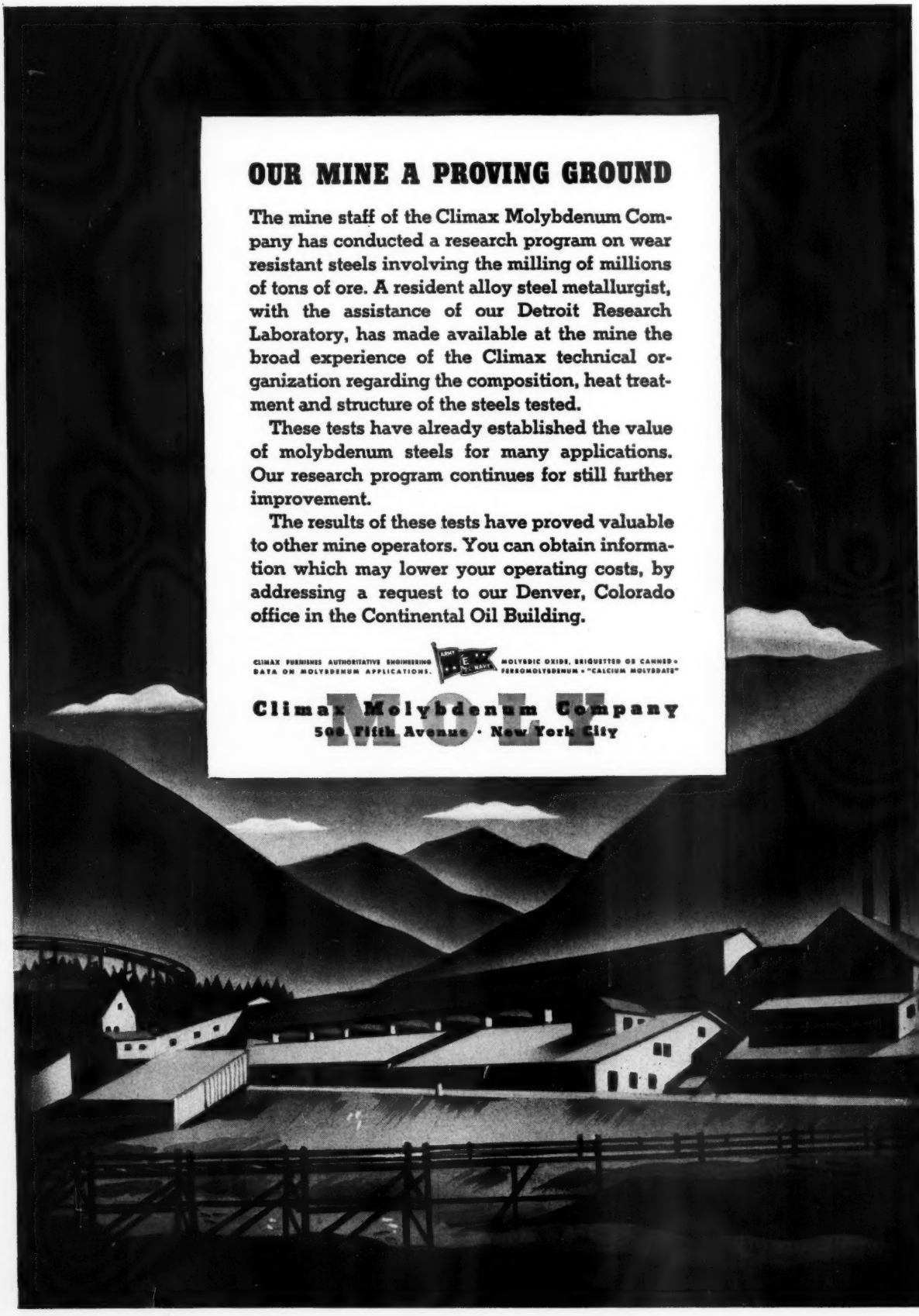
But because a cleaning plant often is a once-in-a-lifetime investment, many operators, naturally adopt a "wait and see" attitude . . . commendably conservative, if time does not run out.

It takes time to run Heavy-Media Separation tests, to design a cleaning plant, to let contracts. More time to break ground and build. 1946 is the YEAR OF DECISION—while markets are assured and there's still ample time to forestall the penalty of low quality in the competitive days ahead.

Cyanamid welcomes the opportunity to work with you or your contracting engineers *now*.



30 Rockefeller Plaza, New York 20, N. Y.



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The mine staff of the Climax Molybdenum Company has conducted a research program on wear resistant steels involving the milling of millions of tons of ore. A resident alloy steel metallurgist, with the assistance of our Detroit Research Laboratory, has made available at the mine the broad experience of the Climax technical organization regarding the composition, heat treatment and structure of the steels tested.

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prises on a policy of always having enough available to keep the mines running. That policy is still in effect, with the modern improvements that have come with advances in forestry. New developments in forest management and protection are part and parcel of Anaconda's program. It is doing everything it can to assure a continuous flow of forest products to the mines as long as the mines shall run.

How Long Must These Forests Last?

Of course no one ventures a guess as to the life expectancy of the Butte mines. But some Montanans regard the company's long-range forest program as something of a criterion. The least that can be said of it is that it is prepared for anything that might come. It speaks volubly of faith in the capacity of the company's lands to grow repeated crops of timber, but at the same time it speaks also of faith in the mines. Whatever the future has in store, the forests as a result of good management will be able to deliver the goods.

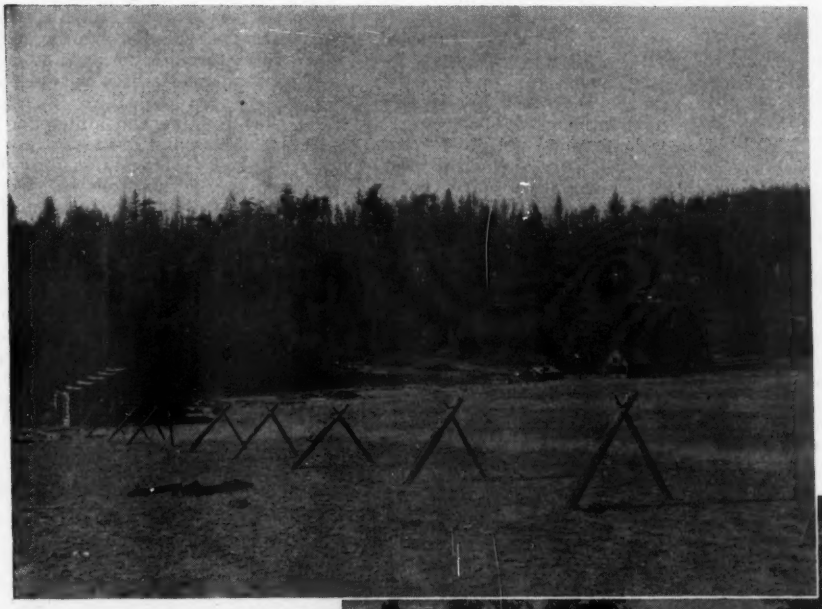
It wasn't any threat of a timber shortage that put Anaconda in the tree farm column. Of the 331,000 acres making up the four tree farms, more than 300,000 acres represent virgin timber—old growth ponderosa pine, larch, fir and other species. Moreover, on lands outside the tree farms, the company has a timber supply sufficient for many years of operation. Thus, establishment of the tree farms can be said to have been purely a move for tomorrow, in line with sound planning for privately owned lands, keeping them continuously productive and pouring their payroll and tax wealth into the State without interruption.

Bonner Produces the Mine Timber

Production hub of the Anaconda Copper Mining Company is, of course, at Butte. The great war job done there by the miners is chronicled in amazing output sheets. It was made possible by some more fine war work farther west—at Bonner, source of Anaconda's mining timbers.

Bonner, just east of Missoula's Hellgate canyon, is a sawmill town at the mouth of the Blackfoot River gorge. Anaconda's mill there, under management of W. C. Lubrecht, produced 103,000,000 ft. of lumber last year and all of it went to war. Forty per cent of it went to the mines in the form of bracing timbers and stulls, and for various other uses below and above ground.

Forests and grazing land flank Bonner in all directions. Valleys are in grass and grain; slopes and towering mountain ranges, in timber. Sheltering town and mill on the northeast is a steep ridge, logged some 60 years ago and now growing a thick new forest that will be ready for harvest in the not too distant future. North from the



Ponderosa pine and larch in Blackfoot drainage. Brush disposal subsequent to logging is not yet complete. Note advanced growth remaining. Immature trees left to grow and spread seeds

Logged and cleared flats are used for grazing until young tree growth forces abandonment

mill, along the scenic Blackfoot River, runs the railroad, 55 miles of Milwaukee and Anaconda road to Woodworth, where a logging operation is now centered under stewardship of Don MacKenzie. The day of log drives down the Blackfoot during freshets is long gone, but such drives were common in the earlier era.

Location of Tree Farms

Out in that direction, and also to the east and west, are the Anaconda tree farms. These are: Clinton-Potomac, 81,918 acres; Fish Creek, 25,276 acres; Thompson River-Pleasant Valley, 182,852 acres; and Belmont-Gold Creek, 41,325 acres. The names were selected by Roscoe Haines, factotum of Anaconda lands, and generally concur with established geographical names of the vicinity.

"It has been our definite desire," said Mr. Lubrecht, "now and in the past to keep the trees growing in areas owned by the company in the western Montana district. The company is using its best efforts to protect young growth in connection with logging operations, and reproduction on these lands appears to be generally satisfactory.

Expect to Keep Forest Land "Green" Indefinitely

"We consider this area as true forest land and expect to keep it in green and growing condition as long as it is in our possession. If at any future time we decide to sell, trade or release any of these lands, we will exert our best efforts to place the ownership in hands of some agency or owner that will continue the same protective policy."

The Anaconda Copper Mining Company has owned most of these lands since 1898, when Marcus Daly, peering into the future, grew convinced that a sustained supply of timber was as much a part of mining as the ore itself. In that year Daly purchased A. W. Hammond's Big Blackfoot Milling Company, with plant at Bonner and forest land all around. Hammond, who later founded a large lumber and shipping firm on the Pacific Coast, had come to Montana in 1885 and had cut his first log into lumber at Bonner in June, 1886.

Prior to acquiring the ample and steady timber supply at Bonner, Anaconda had drawn from as many as 35 little sawmills widely scattered over the extensive Montana forests. With a dependable flow of forest products established at Bonner, the company set up a lumber division geared to meet the needs of the mines. From the very first, practices that were good for the forest prevailed. Partial logging was the rule. Immature trees were left standing to grow and spread seeds, and thus it was not long before a thrifty new forest was established. Evidence of this is visible on every hand now. The young forest is coming along nicely.

Effective Fire Prevention and Suppression Services

Forests in Montana, as elsewhere, have two great enemies—fire and insects. Fires were a curse in the early days, often undoing good results accruing from partial or selective logging. They burned in cutover land and virgin timber without discrimination. Protection was unorganized and ineffective. In 1910 the most disastrous forest fires in Montana history spotted the region, carrying embers from the Clearwater to Nebraska, and it became increasingly plain that something had to be done about it. Organized fire protection followed. The Northern Montana Forestry Association of Kalispell was formed in 1912 and the Blackfoot Forest Protective Association came along later.

These groups, and the United States Forest Service, now provide for western Montana the most effective fire prevention and suppression services that have been devised anywhere. Quick detection and fast action are the keystones. Mobile equipment, trained fire-fighting crews, lookouts, weather information and modern communications give the forest up-to-date help against the great foe. Protection costs are paid by the land owners, and range from 3 to 4 cents an acre per year. Dividends come in the form of vast stretches of green forests, that are putting on "board feet" as fast as nature allows.

Montana residents of the old days may have been inclined to think nothing much of forest fires—but Montanans of today are more fire-conscious and the ratio of man-caused fires to total number of fires is lower than ever, and decreasing. Lightning is the chief offender. A "dry lightning" storm has been known to set 60 or 70 fires. Smoke chasers are kept on the jump during such periods but by "getting there fast" they are usually able to confine outbreaks to small areas.

Insects and Diseases Under Constant Observation

Forest insects are often troublesome. During epidemic outbreaks, such as one in 1932, they kill millions of feet of timber. The most destructive is the western pine beetle, a small bug about the size of a grain of rice, which bores through the bark of ponderosa pines and drills a network of egg galleries in the tree's cambium layer, thus girdling and killing it.

Forest insects and diseases are under continuous observation on the Anaconda tree farms, followed, when required, by technical help from the U. S. Bureau of Entomology and Plant Quarantine.

Logging is done in compliance with Montana forest practice rules of the Western Pine Association. These are designed for the greatest possible protection to the residual growth, so that the land continues in productive condition at all times. Disposal of after-logging brush is a part of this protection. Brush not only is a fire hazard but often serves as a convenient brood haven for tree-killing insects.

Fir slope near Bonner, burned over in 1889, but since protected and now growing into a second crop

Brush disposal on the Anaconda lands is contracted to the State Forestry Department.

40,000,000 Feet Went to Mines in 1944

Ponderosa pine, one of America's most valuable trees, is the principal species on the tree farms, accounting for 45 per cent of the stand. Larch, the rebel conifer which sheds its needles in the fall, represents about 30 per cent of the stand; and Douglas fir, 20 per cent. Englemann spruce and lodgepole pine appear in minor volume.

With this reserve of timber plus the continuous supply that the land will produce, the company plans to protect its mines. Last year 40,000,000 feet went to the mines. The rest of the Bonner production went elsewhere into the war effort, as lumber for boxes and crating and myriad other military uses.

Since Montana forests run 50 per cent to the larch-fir species, Montana mines are credited with making the lumber industry there what it is today. Mines use fir and larch for supporting timbers. Geographically, Montana is at a disadvantage in competitive marketing of these species in the east and elsewhere. Were the industry to depend solely on the manufacture of the more valuable ponderosa pine, it might never have attained its present proportions. The mines have made an ideal home market for these associate species—a market which otherwise would have been available only if Montana had a population of at least 1,500,000 people—which it does not have.

Former Practices Fit Well into Tree Farm System

Tree farm status for Anaconda Copper Mining Company's lands does not mean any drastic change in their management. The lands have been managed and protected right along for continuous productivity, as witness the present flourishing condition of the second crop. The company's forest practices met standards of the American Tree Farm System, which in recent years has dedicated some 10,000,000 acres of privately owned forest land to the mission of growing repeated crops of timber.

However, the tree farm label fits right in with the company's objectives and furthermore calls special attention among the people of Montana to the fact that trees are being grown for the State's tomorrow. It is the hope of the executives that this will serve to increase public consciousness in the forest, further decrease man-caused fires, and generally be of help to all Montana forest lands, private and public.

Anaconda does not say it intends to be in the timber business perpetually. It does intend, however, to see that its mines have timber as long as there are mines. To that end it has adopted this long-range forest program under which, come what may, there will always be a forest on the company's lands, and if these lands are ever conveyed to other ownerships they will be forest lands in good condition.

The road along Salmon Lake, cut over in 1905-06 by Anaconda Copper Mining Company. Such scenic areas are currently left uncut

Last year Anaconda Copper Mining Company's output of finished copper was 1,195,223,947 lbs., and you can guess where most of it went. But copper isn't all this company produces. For instance, zinc, 473,978,086 lbs.; lead, 68,970,626 lbs.; and manganese cadmium, molybdenite, treble superphosphate, arsenic, silver, gold, bismuth, indium, gallium, nickle sulphate, palladium, platinum, selenium, tin, vanadium, white lead and zinc oxide.

Most of these items are strategic in war and America could not have done without them in this struggle. To get them, the mines had to have timber, and so when the plaudits are passed around do not forget those Montana forests.

In upper left is area cut over under National Forest Regulations (brush piled and burned at 75 cents per M feet). Slash disposal in foreground under State of Montana supervision (15 cents per M feet)

Conversion Factors and Formulas

By DONALD J. BAKER
I-T-E Circuit Breaker Co.

Some unit definitions and evaluating data of common application to mine electrical problems

THE use of electricity in mining, as recently pointed out in a report of the American Mining Congress Committee on Underground Power, is becoming more and more an exact science. The operating efficiency of a modern mechanical mine is directly dependent on an adequate supply of power and in order to fulfill the required performance standards, the power system—transformers, conversion units and transmission lines—must be designed in accordance with known correct practices. Such designs can not be made by rule of thumb; neither can the subsequent operation be checked by observation—all determinations must be calculated and the slide rule has become a real factor in mechanized mining.

Electrical calculations, however, involve so many formulas and data, impossible for anyone to keep in mind, that ready references are needed and to supply such a need the following is presented, which gives in convenient form unit definitions and conversion factors which are in common use for mining service. Although it is difficult to obtain universal agreement on what data should be included in a listing of this type, every effort has been made to exclude such material as may be irrelevant or of doubtful value to those in the mining-electrical engineering field and we wish to acknowledge the kindness of J. O. Cree, West Virginia Engineering Company, who assisted in the selection presented here.

Definitions of Basic Units

Ampere (Amp.) (Int.). The international ampere is the current which will deposit silver at the rate of 0.0011180 gram per second. One international ampere equals 0.99985 absolute ampere.

British thermal unit (B.t.u.). The heat required to raise the temperature of 1 lb. of water 1° Fahrenheit at a stated temperature. The mean British thermal unit, B.t.u. (mean), is 1/180 of the heat required to raise the temperature of 1 lb. of water from 32°F. to 212°F.

Calorie (Cal., gram; Cal., kg.). The gram calorie, or small calorie, is the heat required to raise the temperature of 1 gram of water 1° C. at a stated temperature. The mean calorie, **Cal., gram (mean)**, is 1/100 of the heat required to raise the temperature of 1 gram of water from 0°C. to 100°C.

Circular inch (Circ. in.). The area of a circle 1 inch in diameter.

Circular mil (Cir. mil). The area of a circle 1 mil (0.001 inch) in diameter.

Dyne. The cgs. unit of force, defined as that force which when acting continuously upon a mass of 1 gram will impart to it a uniform acceleration of 1 cm. per sec.

Erg. The work done by a force of 1 dyne acting through a distance of 1 cm.

Horsepower (Hp.). The work done at the rate of 550 ft.-lb. per sec. This is the ordinary, or **mechanical horsepower**; it is slightly smaller than the electrical horsepower, **Horsepower (elec.)**, which, by definition, is exactly equal to 760 watts.

Kilogram (Kg.). The fundamental metric unit of mass. It is the mass of a definite platinum-irridium standard, the International Prototype Kilogram, which is kept at the International Bureau of Weights and Measures.

Liter. A metric unit of volume. It is the volume of a kilogram of water at its maximum density (3.98°C.).

Meter. The fundamental metric unit of length. It is the length, at 0°C. and 760 mm., of a certain platinum-irridium bar kept at the International Bureau of Weights and Measures.

Ohm (Int.). The international ohm is the resistance at zero degree centigrade of a column of mercury of uniform cross-section, having a length of 106.300 centimeters and a mass of 14.4521 grams. One international ohm equals 1.00048 absolute ohms.

Pound (Lb.). The avoirdupois lb. is a mass equal to 0.4535924277 kilograms in the United States.

Poundal. The force which acting continuously upon a mass of 1 lb. will impart to it a uniform acceleration of 1 ft. per sec.^{2}

Slug. The mass which will acquire an acceleration of 1 ft. per sec.^{2} when continuously acted upon by a force of 1 lb. weight.

Volt (Int.) The international volt is the voltage that will produce a current of one international ampere through a resistance of one international ohm. One international volt equals 1.00033 absolute volts.

Watt (Int.). The international watt is the power expended when one international ampere flows between two points having a potential difference of one international volt. One international watt equals 1.00018 absolute watts.

PREFIXES

Prefix	Meaning	Numerical Value
Micromicro-	One-trillionth	0.000,000,000,001 or 10^{-12}
Millimicro-	One-billionth	0.000,000,001 or 10^{-9}
Micro-	One-millionth	0.000,001 or 10^{-6}
Milli-	One-thousandth	0.001 or 10^{-3}
Centi-	One-hundredth	0.01 or 10^{-2}
Deci-	One-tenth	0.1 or 10^{-1}
Deka-	Ten	10 or 10
Hecto-	One hundred	100 or 10^2
Kilo-	One thousand	1,000 or 10^3
Mega-	One million	1,000,000 or 10^6

Copies of an 8-page pamphlet from which this article was extracted can be obtained upon request to Donald J. Baker, I-T-E Circuit Breaker Co., Philadelphia 30, Pa.

ELECTRICAL CONVERSION FACTORS

To Obtain	Multiply	By
Abohms (Abs.)	Megohms	1×10^{15}
Abvolts	Volts (Abs.)	1×10^{8}
Abvolts/cm.	Kilovolts/cm.	1×10^{11}
Acre-feet	Cubic ft. (U. S.)	2.29568×10^{-5}
Amperes/sq. in.	Amperes/sq. cm.	6.45163
Ampere-turns	Gilberts (Abs.)	0.79580
Ampere-turns/in.	Abampere-turns/cm.	25.40005
Atmospheres	Ft. of H_2O (39.2° F.)	0.0294992
Atmospheres	In. of Hg. (32° F.)	0.033421
Atmospheres	Lbs./sq. in.	0.0680462
B.t.u. (mean)	Calories, gram (mean)	0.00396832
B.t.u. (mean)	Ft.-lbs.	0.00128530
B.t.u. (mean)	Hp.-hrs.	2,544.90
B.t.u. (mean)	Kw.-hrs. (Abs.)	3,412.76
B.t.u. (mean)/sec.	Ft.-lbs./sec.	0.00128530
B.t.u. (mean)/sec.	Hp.	0.706917
B.t.u. (mean)/sec.	Hp. (elec.)	0.707200
B.t.u. (mean)/sec.	Watts (Abs.)	9.480×10^{-4}
Cm. of Hg. (0°C.)	Atmospheres	76
Cm. of Hg. (0°C.)	Lbs./sq. in.	5.17149
Circular mils	Circular in.	1×10^{6}
Circular mils	Sq. mils	1.27324
Circular mils	Sq. in.	1.27324×10^{6}
Circular mil-ohms/ft.	microhm-in.	15.2789
Cubic centimeters	Cu. ft. (U. S.)	28,317.016
Cubic centimeters	Gals. (U. S., liq.)	3,785.434
Cubic centimeters	Ozs. (U. S., fl.)	29.5737
Cubic centimeters	Pts. (U. S., dry)	550.6136
Cubic centimeters	Pts. (U. S., liq.)	473.1798
Cubic cm./sec.	Cu. ft./min.	471.950
Cubic in. (U. S.)	Cu. cm.	0.061023
Cubic in. (U. S.)	Gals. (U. S., liq.)	231
Cubic in. (U. S.)	Ozs. (U. S., fl.)	1.80469
Cubic in. (U. S.)	Pts. (U. S., dry)	33.6003125
Cubic in. (U. S.)	Pts. (U. S., liq.)	28.875
Degrees	Min. (angular)	0.0166667
Dynes	Grams	980.665
Dynes	Kilograms	980,665
Dynes	Lbs. (apoth. or troy)	3.66025×10^{5}
Dynes	Lbs. (avdp.)	4.44822×10^{5}
Dynes/sq. cm.	Ft. of H_2O (39.2° F.)	29,890.1
Dynes/sq. cm.	In. of Hg. (32° F.)	33,864
Dynes/sq. cm.	Lbs./sq. ft.	478.803
Ergs	B.t.u. (mean)	1.05487×10^{10}
Ergs	Ft.-lbs.	1.35582×10^{7}
Ergs/sec.	B.t.u. (mean)/sec.	1.05487×10^{10}
Ergs/sec.	Ft.-lbs./sec.	1.35582×10^{7}
Ergs/sec.	Hp.	7.45702×10^{9}
Ergs/sec.	Kw. (Abs.)	1×10^{10}
Ft. (U. S.)	Meters	3.280833
Ft. (U. S.)	Mils	8.33333×10^{-5}
Ft. of H_2O. (39.2° F.)	In. of Hg. (32° F.)	1.1330
Feet/(sec. × sec.)	Gravity(std.)	32.1740
Feet/min.	Cm./sec.	1.9684998
Ft.-lbs.	B.t.u. (mean)	778.028
Ft.-lbs.	Hp.-hrs.	1.98×10^{6}
Ft.-lbs.	Kw.-hrs (Abs.)	2.65522×10^{6}
Ft.-lbs./sec.	B.t.u. (mean)/min.	12.9671
Ft.-lbs./sec.	Hp.	550
Ft.-lbs./sec.	Watts (Abs.)	0.737557
Ft.-lbs./min.	Hp.	33,000
Gals. (U. S., liq.)	Cu. cm.	0.000264173
Gals. (U. S., liq.)	Cu. ft. (U. S.)	7.48052
Gals. (U. S., liq.)	Cu. in. (U. S.)	0.00432900
Gals. (U. S., liq.)	Liters	0.264178
Gals./sec.	Cu. ft./sec.	7.4805
Grams/cm.	Lbs./ft.	14.88161
Grams/cu. cm.	Lbs./cu. in.	27.67974
Grams/in.	Lbs./ft.	37.79937
Grams/sq. cm.	Atmospheres	1,033.228
Grams/sq. cm.	Cm. of Hg. (0° C.)	13.59508
Grams/sq. cm.	Ft. of H_2O. (39.2° F.)	30.4794
Grams/sq. cm.	In. of Hg. (32° F.)	34.532
Grams/sq. cm.	Lbs./sq. ft.	0.488241
Gram-cm.	B.t.u. (mean)	1.07566×10^{7}
Gram-cm.	Ft.-lbs.	13,825.5
Gram-cm./sec.	Ft.-lbs./sec.	13,825.5
Hp.	B.t.u. (mean)/min.	0.0235766
Hp.	Cal., gram (mean)/min.	9.35595×10^{-5}

To Obtain	Multiply	By
Hp.	Ft.-lbs./min.	3.0303×10^{-5}
Hp.	Hp. (elec.)	1.00040
Hp.-hrs.	B.t.u. (mean)	0.000392943
Hp.-hrs.	Ft.-lbs.	5.05050×10^{-7}
Hp.-hrs.	Kw.-hrs. (Abs.)	1.34102
Hp.-hr./lb.	B.t.u. (mean)/lb.	0.000392943
In. (U. S.)	Cm.	0.3937
In. (U. S.)	Mils	0.001
Joules (Abs.)	Calories, gram (mean)	4.18605
Joules (Abs.)	Ft.-lbs.	1.35582
Joules (Abs.)	Hp.-hrs.	2.68453×10^{6}
Joules (Abs.)	Watt-hrs. (Abs.)	3,600
Joules (Int.)	Joules (Abs.)	0.99980
Kg.	Grains	6.4798918×10^{-5}
Kg.	Lbs. (apoth. or troy)	0.37324177
Kg.	Lbs. (avdp.)	0.4535924277
Kg.	Tons (short)	907.18486
Kg.-meters	B.t.u. (mean)	107.566
Kw. (Abs.)	B.t.u. (mean)/min.	0.0175811
Kw. (Abs.)	Cal., gram (mean)/min.	6.97674×10^{-5}
Kw. (Abs.)	Ft.-lbs./min.	2.25970×10^{-5}
Kw. (Abs.)	Hp.	0.745702
Kw. (Abs.)	Watts (Abs.)	0.001
Kw.-hr. (Abs.)	B.t.u. (mean)	0.000293018
Kw.-hr. (Abs.)	Ft.-lbs.	3.76617×10^{-7}
Kw.-hr. (Abs.)	Hp.-hrs.	0.745702
Kw.-hr. (Abs.)	Watt-hrs. (Abs.)	0.001
Liters	Cu. ft. (U. S.)	28.31625
Liters	Gals. (U. S., liq.)	3.785332
Lumens/sq. ft.	Ft.-candles	1
Lumens/sq. meter	Ft.-candles	10.7639
Megohms (Abs.)	Abohms	1×10^{-15}
Megohms (Abs.)	Ohms (Abs.)	1×10^{-6}
Meters	Ft. (U. S.)	0.3048006096
Microns	Cm.	10,000
Microns	In. (U. S.)	25,400.0508
Microhm-cm.	Microhm-in.	2.540005
Microhm-in.	Microhm-cm.	0.3937
Mils (U. S.)	Cm.	393.7
Mils (U. S.)	In. (U. S.)	1,000
Min.	Radians	3,437.75
Ohms (Abs.)	Megohms	1×10^{6}
Ohms (Int.)	Ohms (Abs.)	0.99952
Ozs. (Avdp.)	Grains	0.00228571
Ozs. (Avdp.)	Grams	0.03527396
Ozs. (Avdp.)	Ozs. (apoth. or troy)	1.0971429
Ozs. (U. S., fl.)	Cu. cm.	0.033814
Ozs. (U. S., fl.)	Cu. in.	0.55411
Ozs. (U. S., fl.)	Gals. (U. S., liq.)	128
Lbs.	Slugs	32.174
Lbs. (avdp.)	Grains	0.0001428571
Lbs. (avdp.)	Grams	0.00220462
Lbs. (avdp.)	Lbs. (apoth. or troy)	0.8228571
Slugs	Geepounds	1
Sq. cm.	Circular in.	5.0671
Sq. cm.	Circular millimeters	0.0078540
Sq. cm.	Circular mils	5.0671×10^{-6}
Sq. cm.	Sq. ft. (U. S.)	929.0341
Sq. cm.	Sq. mils	6.4516258×10^{-6}
Sq. in. (U. S.)	Circular in.	0.78540
Sq. in. (U. S.)	Circular mils	7.8540×10^{-7}
Sq. in. (U. S.)	Sq. cm.	0.15499969
Sq. in. (U. S.)	Sq. mils	1×10^{-6}
Sq. meters	Sq. ft. (U. S.)	0.09290341
Sq. mils	Circular in.	7.8540×10^{5}
Sq. mils	Circular mils	0.78540
Sq. mils	Sq. cm.	154,999.7
Statvolts	Abvolts	3.33585×10^{-11}
Statvolts	Volts (Abs.)	0.00333585
Watts (Abs.)	B.t.u. (mean)/min.	17.5811
Watts (Abs.)	Ft.-lbs./min.	0.0225970
Watts (Abs.)	Hp.	745.702
Watts (Abs.)	Hp. (elec.)	746
Watts (Abs.)	Kw. (Abs.)	1,000
Watts (Int.)	Watts (Abs.)	0.99980
Watt-hr. (Abs.)	B.t.u. (mean)	0.293018
Watt-hr. (Abs.)	Ft.-lbs.	0.000376617
Watt-hr. (Abs.)	Hp.-hrs.	745.702
Watt-hr. (Abs.)	Kw.-hrs. (Abs.)	1,000

MECHANICAL LOADING—

—in closely timbered workings or narrow entries . . .

If you have to operate loading machines in closely timbered workings and narrow entries, then safety, plus maximum efficiency, is most important to you. Under these conditions no operator can afford to overlook the advantages of the Whaley "Automat" and here are two prime reasons why.

In the first place, safety of the "Automat" is well known. Sudden side-kicking of machine, knocking out of timbers, or crushing of men is not possible because the shovelling or loading action is in a vertical plane. This vertical shovelling and lifting action is particularly effective in tight shots. After moving forward under the material, it lifts and simultaneously pulls directly backward for depositing material on Jib conveyor.

In the second place, the overall width of the "Automat" is considerably less than any other machine of comparable capacity. This narrow width of the "Automat" permits working in small openings and closely timbered sections that would be too tight for other loaders of comparable capacity. Furthermore, the "Automat's" overall width of only 5 feet 8 inches allows great flexibility in use with maximum efficiency.

With these two exclusive features you can depend upon the Whaley "Automat" for maximum safety . . . for maximum efficiency, and where it is needed most . . . in closely timbered workings or narrow entries.

When writing for additional information on the Whaley "Automat" please mention your conditions. Myers-Whaley Company, Manufacturers, Knoxville 6, Tennessee.

★ ***Remember, the "Automat" will load—in its stride —any lump of coal that will pass through your tipple, or any lump of rock your cars, aerial tram or larry, can take.***

• • •

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Mine Haulage With Locomotives And Track

A Report of the Haulage Roads Committee

Submitted by E. H. JENKS

THE report submitted here on mine track and locomotive haulage is a part of a joint study on underground transportation which is being made by the Conveyor and the Haulage Committees and supplements the first section, covering all-belt transportation, which was published in the October MINING CONGRESS JOURNAL. These, however, are not joint reports; each one is made independently and by different men with, however, the joint purpose of compiling actual experience to show under what conditions mine track and belts each offer the greatest operating advantage for underground use and to present basic facts to illustrate how individual haulage problems should be approached. As further explained in the conveyor report, each committee bases its calculations on mining a similar property with assumed similar physical conditions—an area approximately 4 miles long by 1¼ miles wide containing an estimated recoverable tonnage of 21,500,000; a shaft opening at the center of the 4-mile boundary line; grades to be approximately level and the property in general to have no problems of drainage, ventilation or roof support that would affect either transportation system adversely.

Mine and Haulage Systems

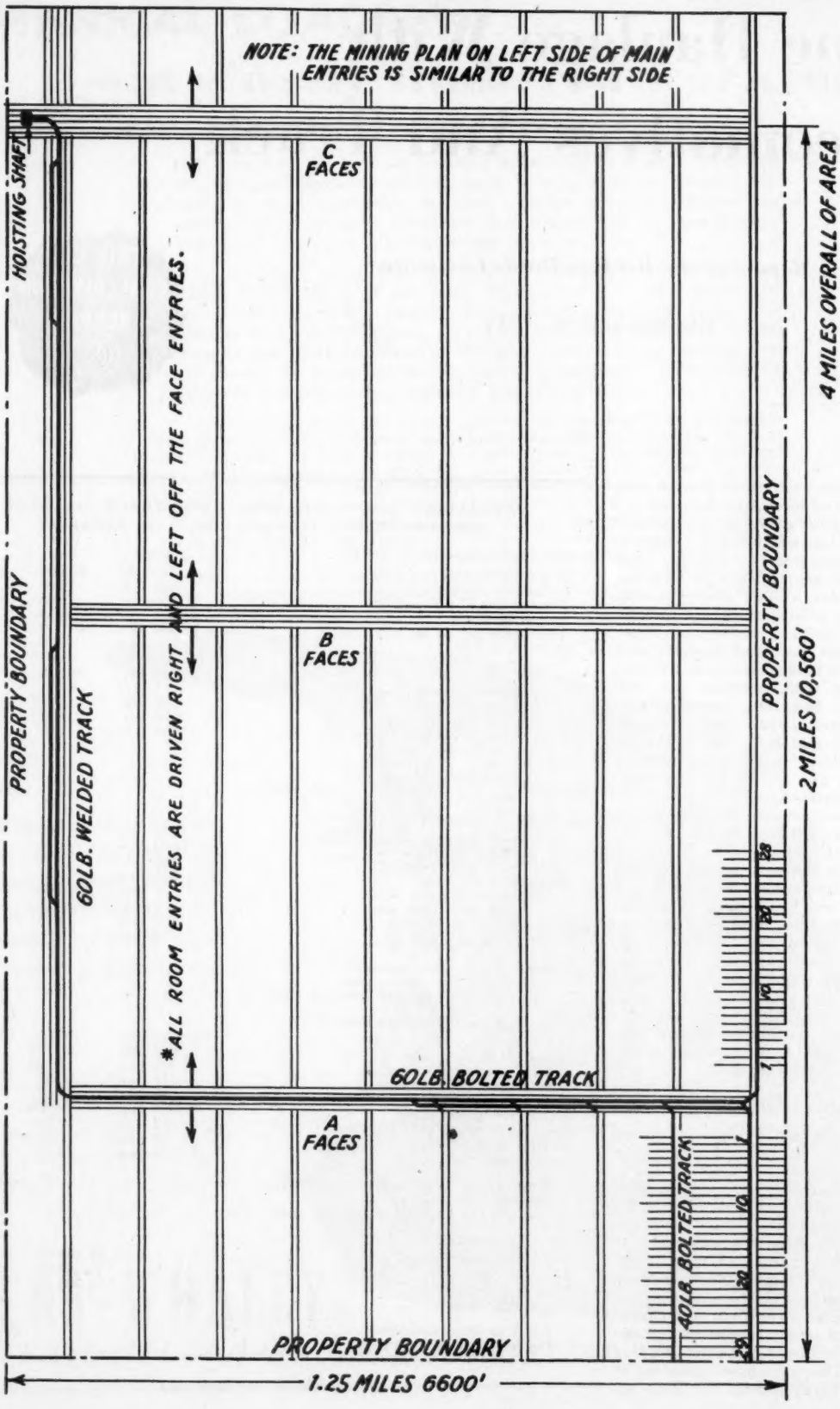
Track haulage, being one of the oldest forms of underground transportation, has by processes of evolution and invention developed a wide variety of methods and equipment for meeting practically every known mining condition—that is to say coal mining. It offers great flexibility in design for operating thick and thin seams; level grades, steep grades, and changing grades; straight and curved entries; wet or dry conditions and can be readily adjusted to handle varying outputs. The committee therefore in choosing the equipment for their re-

INSTALLING AND OPERATING MINE TRACK HAULAGE

ESTIMATED ORIGINAL COST OF MATERIAL AND EQUIPMENT

	Units	Unit Cost	Total Cost
60 lb. Track Material:			
60 lb. rail (welded)	206 ton	$48.00	$9,888.00
60 lb. rail (bolted)	165 ton	48.00	7,920.00
Treated ties 5" x 7" x 6' 0"	11,225 pcs.	.96	10,776.00
Spikes ½ x 4½	93 kegs	8.38	779.34
Angle bars for 60 lb. (24" long)	640 pr.	1.19	761.60
Bolts ¾ x 3½	10½ kegs	9.73	102.17
Welding material	696 jts.	2.675	1,861.80
No. 5 switches	18 pcs.	146.50	2,637.00
No. 5 switch tie sets	18 sets	34.77	625.86
Cross bonds 4/0 48"	102 pcs.	1.491	152.08
Rail joint bonds 4/0 32"	640 pcs.	1.084	693.76
Ballast slag 9" below top of ties	3,330 ton	1.60	5,328.00
Total 60 lb. track material			$41,525.61
Depreciation at 10 per cent			4,152.56
Cost per ton at 600,000 tons per year			$0.007
40 lb. Track Material:			
40 lb. rail (bolted)	39 ton	43.57	$1,699.23
40 lb. steel-wood ties	1,884 pcs.	1.46	2,750.64
Angle bars (20" long)	220 pr.	.70	154.00
Bolts ¾ x 3"	3½ kegs	9.51	33.29
No. 3½ switches	9 pcs.	85.00	765.00
Steel-wood switch tie sets	9 sets	28.75	258.75
Rail joint bonds 4/0 28"	220 pcs.	1.04	228.80
Cross bonds 4/0 48"	15 pcs.	1.491	22.37
Total 40 lb. track material			$5,912.08
Depreciation at 20 per cent			1,182.42
Cost per ton at 600,000 tons per year			$0.002
Trolley and Feed Wire Material:			
No. 9 section trolley wire	27,646 lbs.	$0.18	$4,976.28
500,000 CM feed line	22,697 lbs.	.175	3,971.98
Dual suspension clamps	735 pcs.	1.122	824.67
Single suspension clamps	415 pcs.	.41	170.15
Mine hangers	1,150 pcs.	.637	732.55
Expansion bolts	1,150 pcs.	.308	354.20
Feed wire splicers	14 pcs.	2.61	36.54
Trolley wire splicers	23 pcs.	1.60	36.80
Section switches	4 pcs.	16.00	64.00
Total trolley and feed wire material			$11,167.17
Depreciation at 10 per cent			1,116.72
Cost per ton at 600,000 tons per year			$0.002
Haulage Equipment:			
8 ton reel locomotives	3	$7,500.00	$22,500.00
10 ton locomotives	2	10,000.00	20,000.00
15 ton locomotives	2	14,000.00	28,000.00
7 ton mine cars	110	800.00	88,000.00
Total haulage equipment			$158,500.00
Depreciation at 10 per cent			15,850.00
Cost per ton at 600,000 tons per year			$0.026

(*Continued on page 49*)


NOTE: THE MINING PLAN ON LEFT SIDE OF MAIN ENTRIES IS SIMILAR TO THE RIGHT SIDE
HOISTING SHAFT
C FACES
B FACES
A FACES
*ALL ROOM ENTRIES ARE DRIVEN RIGHT AND LEFT OFF THE FACE ENTRIES.
60LB. WELDED TRACK
60LB. BOLTED TRACK
40LB. BOLTED TRACK
PROPERTY BOUNDARY
PROPERTY BOUNDARY
PROPERTY BOUNDARY
4 MILES OVERALL OF AREA
2 MILES 10,560'
1.25 MILES 6600'
1
10
20
28
1
10
20
29

(*Continued from page 47*)

ESTIMATED LABOR FOR INSTALLING AND REMOVING TRACK AND WIRE

60 lb. welded track for half of property	10,428	ft.	2.35	$24,505.80
60 lb. bolted track for half of property	29,500	ft.	2.35	69,325.00
40 lb. bolted track for half of property	184,000	ft.	.30	55,200.00
No. 5 switches, 60 lb., for half of property	46	pcs.	125.00	5,750.00
No. 3½ switches, 40 lb., for half of property	322	pcs.	80.00	26,760.00
No. 9 section trolley wire for half of property	224,328	ft.	.15	33,649.20
500,000 CM feed line for half of property	23,700	ft.	.15	3,555.00
Total				$218,745.00
Cost per ton, half of property, 10,750,000 tons				$0.020

ESTIMATED LABOR FOR MAINTENANCE AND OPERATION

2 Dispatchers at 8 hours	$16.00
4 Main line motormen at 8 hours	32.00
2 Switching motormen at 8 hours	16.00
2 Switching brakemen at 8 hours	16.00
6 Gathering motormen at 8 hours	48.00
6 Gathering brakemen at 8 hours	48.00
2 Maintenance of equipment men at 8 hours	16.00
2 Track and wire maintenance men at 8 hours	16.00
Total	$208.00
Cost per ton at 2,400 tons per day	$0.087

ESTIMATED POWER COST

Main haul—two 15-ton locomotives	0.490 KWH/ton
Flat haul—one 10-ton locomotive	0.232 KWH/ton
Butt headings—three 8-ton locomotives	0.075 KWH/ton
	0.797 KWH/ton
Power cost at $0.02 per KWH	$0.016 per ton

ESTIMATED TOTAL OPERATING COSTS

	Cost Per Ton
60 lb. track material	$0.007
40 lb. track material	0.002
Trolley and feed wire material	0.002
Haulage equipment	0.026
Labor for installing and removing track and wire	0.020
Labor for maintenance and operation	0.087
Power cost	0.016
Estimated total operating cost per ton	$0.160

port necessarily had to make some arbitrary decisions but it is believed that the specifications selected as to weight of rail, size of locomotives, etc., are those which are most commonly used for average normal coal seams. However, as in the case of the conveyor report, it is not the intention of the Haulage Committee to say that the equipment specified here is best for all conditions; these items, as well as the costs, are subject to modifications from a number of causes but the figures can be taken as a basis and adjusted according to other conditions encountered.

The accompanying map shows the mining plan as designed for locomotive haulage, operating three room headings each estimated to produce 400 tons per shift for a total production of 2,400 tons per day on double shift, or 600,000 tons per year. As in the conveyor report, the haulage system is figured from the shaft to the room necks only and the method of mining the coal at the face and transporting it from the face to the room neck does not enter into consideration here. Also, assuming a level seam, rooms and entries are worked in both directions, advancing and retreating.

Selection of Equipment

The main east headings and the "A" face headings both have track with 60 lb. rail. The main east has welded joints with 600 ft. of sidetrack at the shaft bottom with one cross-over and one passing track just inby of "B" face. "A" face has bolted joints with about one-half of the heading double tracked, that being the inby half with one cross-over just outby of each pair of butts. All 60 lb. track is on 5-in. x 7-in. x 6-ft. treated ties. The butt headings are laid up with 40 lb. bolted track on steel-wood ties. Trolley wire throughout is No. 9 section suspended with 500,000 CM feeder to the last butt heading.

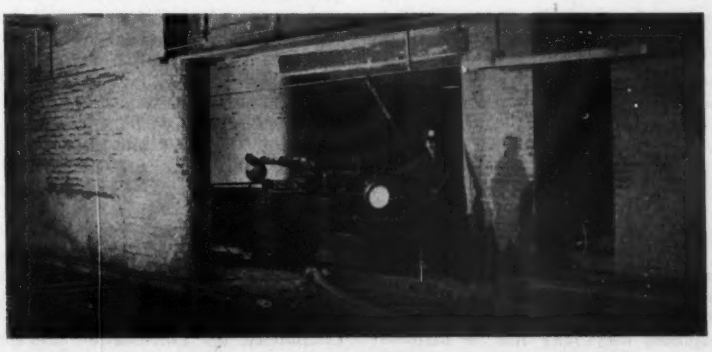
The equipment figured as necessary is two 15-ton haulage locomotives for main line service, two 10-ton locomotives, one for switching service on the last sidetrack into the room entries and the second used as an extra or for supply service when necessary, and three 8-ton reel locomotives, one for service in each butt heading. Mine cars are 7-ton capacity and 110 are needed.

The depreciation schedule is set up the same as in the conveyor committee's report, except that 40 lb. track has a 20 per cent rate or five year life. The installation and removal of track is figured for half the property (10,750,000 tons), as in the conveyor committee report, which would mean the main east and 2½ face headings.

Comparison of Costs

In considering the similarity between the total operating cost estimate for track haulage as compared to the belt conveyor cost (both approximately 16 cents per ton), it should be noted that the two reports disagree in one respect—the conveyor committee assumed that a production of 1,200 tons per shift could be mined from two room headings while this track report assumes that three room headings are needed. To put both estimates on an exactly comparable basis, either one of two adjustments are indicated—(1) the conveyor mine should include a third room entry with its additional investment and operating cost or (2) the track mine should eliminate one room heading with a corresponding reduction in its installation and operating cost. The choice, however, is for the individual operator to make and will be determined by his own idea as to whether two or three room entries are needed to produce 1,200 tons per shift.

A continuation of the joint study by the two committees is planned in which the same mining property will be projected for a combination of rail and belt transportation—rail for the main line and belt for the secondary haulage.



WHEELS OF GOVERNMENT

A BRIGHTER outlook toward the reconversion years was given by the President's signing of the Revenue Act of 1945 on November 9, providing repeal of the excess-profits tax December 31, with moderate reductions in corporate and individual levies. This first measure of the Administration program is slated to be followed before the holiday recess by enactment of a moderate "Employment—Production" measure, the President's reorganization bill, the "Rescission" appropriation bill, extension of the Second War Powers Act, and possibly the minimum wage increase under the Fair Labor Standards Act. Meanwhile, accompanied by an atmosphere of White House and departmental approval, strategic materials stockpiling legislation is progressing toward enactment.

Stockpile Action

Following the October 30 hearings before Senator O'Mahoney's Military Affairs Subcommittee on the Thomas-May bill, S. 752, and other stockpiling measures, the full Senate Committee on Military Affairs on November 29 reported a rewritten measure which is due for early floor consideration. The bill now directs the President to determine which materials are strategic, the amounts to be stockpiled, and the dates by which they should be acquired. The President is authorized to appoint the chairman of the Stockpiling Board and the chairman in turn is directed to appoint industry advisory committees. Purchases of materials for the stockpiles are to be made from such quantities as are in excess of current industry demand, at a price not less than the current open market price. Six months' notice of any proposed disposition of stockpiled material must be published in the *Federal Register* and transmitted to Congress, stating the reason for such proposed action, the amounts of materials proposed to be released, and the proposed plan and date and disposition; and except where the materials have been determined to be obsolescent for war purposes, they may not be disposed of without the express approval of Congress.

In the rewritten bill all forms of strategic materials held by the Government would be transferred to the permanent stockpile, including such materials received under reverse lend-lease. Only the following would be exempt from such transfer: contractor inventories prior to being taken over by the owning agency; amounts determined by the chairman to be necessary to make up current deficiencies in the supply for civilian industry; small lots; and materials that cannot be economically converted to meet stockpile requirements. Foreign purchases of critical and strategic materials made for stockpiling purposes would be duty free but it is provided that the duty shall be added in case of resale.

Management-Labor Conference

Disappointed by the lack of results from the Management-Labor Conference, which endeavored from November 5 to November 30 to bring forth a solution to the post-war industrial relations problems, President Truman has asked the Congress to enact legislation providing fact-finding boards to act on major strike situations in a manner following the principles of the Railway Labor Act.

In general the labor delegates were resistant to the efforts put forth by the representatives of management during the four-week conference, although the reports of three of the committees were approved, including those on (1) Existing Collective Agreements, (2) Initial Agreements, and (3) Conciliation Services. The Committee on Existing Collective Agreements recommended that grievances be settled without recourse to strikes or lockouts and that they be subject to binding arbitration. The Committee on Initial Agreements recommended good faith in collective bargaining together with avoidance of ultimatums and inflammatory statements, and a pledge for conciliation and voluntary arbitration prior to the use of the strike weapon. The Committee on Conciliation Services recommended expansion of the Department of Labor's Conciliation Division and the setting up of a management-labor advisory committee to assist the Department.

The labor delegates balked at legislative proposals for equality of status before the law under collective bargaining, and likewise opposed guarantee of compliance with anti-strike and anti-lockout provisions. Also resisted was the exclusion of the use of force in collective bargaining and assurance of protection to individuals and property. Clear definitions of the functions and responsibility of management including the position of foremen and supervisory employes, was shouldered off, and the labor men persisted in their position that present laws for the determination of union representation and jurisdictional disputes are sufficient.

Labor Legislation

The critical strike situation is expected to increase interest in the Smith bill, H. R. 3937, repealing the Smith-Connally labor disputes act

★★★★★★★★★★★★★★★★★★ Washington Highlights

WHITE HOUSE: Calls for fact-finding in labor disputes.

STOCKPILING: Senate considering bill reported by Military Affairs Committee.

CONFERENCE ENDS: Management-Labor Conference closes in deadlock.

GWYNNE BILL: House passage sought to limit suits.

USES: Returned to states in 100 days.

"FULL EMPLOYMENT": Moderate measure reported to House.

MINIMUM WAGE: No action expected before Christmas.

OIL PIPELINES: Use for gas transport protested.

WATER POLLUTION: Witnesses attack punitive Mundt bill.

GOLD: California's Clair Engle would restore circulation of gold coins and certificates.

SILVER: Manufacturers press for Treasury sales.

★★★★★★★★★★★★★★★★★★

provisions for plant seizures and NLRB strike votes, as well as penalizing unions violating no-strike provision in their contracts. A further floor amendment proposed for this measure would exclude unions from recognition as collective bargaining agents if they include supervisory or professional employes in their membership.

The Hobbs anti-racketeering bill is likewise pending on the House floor, also the Gwynne bill which would limit back pay claims and other actions under Federal statutes to a one-year period. Ready for the President's signature is the "Rescission" appropriation bill which carries a rider returning the U. S. Employment Service to the States 100 days after enactment.

"Full Employment"

Representative Carter Manasco's Committee on Expenditures in the Executive Departments has approved a rewritten version of the President's "Full Employment" bill, now designated as the "Employment—Production Act," which eliminates any guarantee of "full employment" through Government spending. The new measure declares that it is the continuing policy of the United States to stimulate private enterprise in the period in which widespread unemployment exists or threatens "so as to stimulate and promote employment (including self-employment), production, and purchasing power in a free competitive economy, thereby aiding and assisting employables (including self-employed) in such periods to secure employment, and to aid in removing or preventing inflationary or deflationary conditions in periods in which such conditions exist or threaten." This is to be accomplished by preserving and encouraging the American economic system of free competitive enterprise; by fostering investments of private capital in trade, agriculture, commerce, and in the development of the natural resources of the United States; by encouraging individual initiative; avoiding competition of government with private business enterprise; and adopting sound fiscal policies and maintaining the credit of the United States. Provision is made for economic reports to Congress by the President and an Advisory Council is created to assist him on economic problems. Local programs of public works, Federal loan programs when unemployment threatens to become widespread, and public works programs carried out by private contractors are to be encouraged. Inasmuch as this bill is a pet White House measure it may have to run the gauntlet of efforts on the House floor to attach all forms of rider legislation.

Minimum Wage

Still before the House Committee on Labor is legislation proposing increase in the minimum wage under the Fair Labor Standards Act from the present 40 cents to 65 cents an hour, with an ultimate increase to 75 cents. The committee hearings closed in mid-November, with final testimony offered by L. Metcalfe Walling, Administrator of the Wage-Hour Division. He offered the suggestion that the industry committee machinery previously used to bring the minimum up to 40 cents an hour is a more flexible method for increasing the minimum above the proposed 65 cents. He approved the fixing of wage differentials "between interrelated job classifications" by industry committees authorized to recommend minimum rates for a limited number of "peg" job classifications, around which he said appropriate rates for other job classifications could be established by individual or collective bargaining.

Walling reiterated his recommendations for a three-year statute of limitations on suits for back pay and asked for authority to define the general terms of the Act so as to protect an employer who complies with the Administrator's interpretations. He also advocated power for the Administrator to sue for back wages on behalf of underpaid employes and for the protection of an employer who has paid restitution, from suits for double damages except in the case of wilful violation.

Oil Pipelines

Representatives of coal producers, distributors, mine workers and coal transporting railroads in the Appalachian region and the mid-West observed with intense interest the hearings on disposal of the "Big Inch" and "Little Big Inch" petroleum pipelines before the Senate Military Affairs Surplus Property Subcommittee in mid-November. The petroleum industry's Committee on Post-War Disposal of Pipelines, Refineries and Tankers presented a witness who stated that the pipelines should be kept idle, but that their best utilization would be as carriers of natural gas. Various witnesses suggested outright sale of the lines at public auction; use for storage purposes; for pumping petroleum products to various communities; for transmission of natural gas; use as common carriers for crude products for the benefit of independent oil producers; or their maintenance in standby condition for strategic purposes in the event of a future military necessity. It was stated that petroleum transport by seagoing tankers is cheaper than by long pipelines.

Coal industry witnesses warned of widespread unemployment and heavy compensation and relief costs if the lines are used to transport natural gas, and the railroads testified that a large part of the revenue now obtained for the transportation of coal will be jeopardized by the wider distribution of natural gas as a competing fuel. As matters stand the two big pipelines have been filled with water treated with sodium hydroxide and plans call for later replacement with a mixture of air and inert gas. Further hearings are to be held on the pipeline disposal before the Federal Power Commission which is currently investigating the natural gas industry.

Water Pollution

No further action is anticipated until January or February on the water pollution bills which were the subject of hearings before the House Committee on Rivers and Harbors in November. Of these measures the familiar Mundt bill, which provides centralized Federal control and policing, fixes "standards of cleanliness," declares the discharge of waste a public and common nuisance and provides Federal court action for abatement, was opposed by industrial witnesses and by the U. S. Public Health Service.

A more moderate measure, the Spence bill, was approved in principle by the majority of witnesses. This measure provides for cooperative studies and surveys, encouragement of compacts between States, enactment of uniform State laws and assistance to State agencies, municipalities and industries in formulating programs for pollution abatement. Appropriations up to $100 million are authorized to be expended annually for grants-in-aid and loans for the correction of pollution, and $1½ million is provided annually for allotment to States making surveys and studies. The Spence bill resembles the Barkley-Vinson measure passed by the House and Senate in 1938 and then vetoed by President Roosevelt because it contained no provision for budgetary control.

In presenting the views of the mining industry to the Committee the American Mining Congress vigorously opposed the punitive Mundt bill, calling attention to the principle of the "balancing of conveniences," whereby the relative necessity and requirements of industries or individual establishments and the communities and populations dependent thereon should be given the fullest consideration as compared with the population and communities which may be affected by discharge of industrial wastes. The point was made that

(Continued on page 55)

A Declaration of Policy

THE BOARD OF GOVERNORS

of the

WESTERN DIVISION, AMERICAN MINING CONGRESS

Assembled in annual meeting, Salt Lake City, Utah, November 27, 1945, declares its views upon the following matters of public policy:

THE WAR IS ENDED, but the effect of war remains. Social and economic wounds must be healed and the constructive ability of a free people mobilized for a restoration of the life we once knew.

The mining industry gave its best for the winning of the war. That best combined with the best of all other industries and of labor demonstrated that the private enterprise system of a free people is more than a match for the planned economy and forced labor of totalitarian states. Now the task is to prove that this system can restore orderly processes and reestablish peace and happiness upon the ruins made by war.

The mining industry has been hurt but not disabled by its all-out war participation. It has used up reserves of metals which would not have been produced for normal consumption over a period of many years. Its program of development was curtailed and in many cases entirely abandoned in order to give full play to production. Its experienced miners and technicians were sent to the armed forces. Its crews, even of inexperienced men, were reduced by movement into the services and into war industries. It is still suffering from serious shortage of manpower and from less efficient personnel.

But the metal mining industry is ready to start anew upon a program of exploration and development. Our mineral resources have not been used up nor are they in danger of early exhaustion, despite the gloomy forecasts of certain people in high places. The men best qualified to know, by training and first-hand experience, say most emphatically "this is not a 'have not' nation so far as metals and minerals are concerned—nor is it likely to become such."

The mining industry sings no hymns of requiem, but rather chants the psalms of hope and confident promise of reward to those who, with faith and courage, go forth to repeat the accomplishments of the pioneers in mineral development, production and beneficiation. The industry asks fair opportunity and a lessening of governmental burdens; it asks that restrictions on primary mine financing be reduced to the minimum required to prevent fraud, and that governmental servants use their power to help and not to hinder honest promotion; that private ownership and development be encouraged; that government by law be restored and government by executive directives eliminated.

The need for the products of the mines never was greater. The better world to live in is dependent upon the ability of the mining and metal industries to supply the raw materials for the machines and appliances which are demanded. The preservation of peace is tied up with our ability to maintain the production of the machines to prevent war.

On this threshold of a postwar world the mining industry asks for full and complete cooperation of government, labor and capital in the restoration of depleted ore reserves; in labor and management relations which will eliminate waste and delay; in government encouragement to development programs; in capital's willingness to take a chance in seeking new sources of metals and minerals. Granted these we have an abounding faith in our ability to produce the mineral raw materials with which nature has so blessed this land of ours.

LABOR RELATIONS

Return to peacetime economy with a high level of employment requires uninterrupted mineral production with reasonable profit. Wartime concessions of greatly increased rates of pay and of other wage-increasing devices cannot be maintained without greater productivity of labor. The wartime increase in labor cost and decrease in labor efficiency have jeopardized the welfare of the mining industry which is so essential to a healthy peacetime economy.

We re-state our belief in collective bargaining and that the proper and sole functions of government in labor disputes are to act as an impartial conciliator and to hold employers and employees alike responsible before the law for their actions. We believe that the strike or lockout weapon should not be invoked until both parties have exhausted genuine direct negotiations and conciliation, and that collective bargaining should be suspended while a work stoppage by employees is in progress. We do not believe in compulsory arbitration.

Collective bargaining agreements should be reduced to writing, signed by the parties and then observed both as to the letter and the spirit. We therefore recommend that each such agreement provide for appropriate guarantees, such as the posting by each party of a performance bond to guarantee complete and effective compliance with provisions of the agreement prohibiting strikes, lockouts or boycotts. For cases in which unions will not agree to such a guarantee, we recommend a law whereby unions which violate the no-strike provision will lose their bargaining rights. Laws and governmental regulations control the activities and responsibilities of employers; similarly, labor organizations should be controlled to assure equality of status before the law.

All men should have the right to work regardless of union affiliation or lack thereof, and that right should be fully enforced and protected by law. The Congress should definitely declare that supervisory and professional employees are not covered by the provisions of the National Labor Relations Act. Management must retain the right to manage and the functions of management must not be impaired by union organization of its supervisors nor by any other device.

We urge the Congress to repeal the War Labor Disputes Act as proposed in H. R. 3937.

STOCKPILES

We endorse the creation of permanent stockpiles of strategic minerals and metals to be held exclusively for purposes of National Defense. Materials in these stockpiles should not be released for any other purpose without the express approval of Congress. We urge that such legislation be passed immediately.

TARIFF

The need for adequate mineral and metal production from the mines of the United States in time of national emergency has been forcefully demonstrated in the past five years. To protect our nation against any future threats to its security, and to permit continuation of a basic industry essential to the economy of the country, our mines must of necessity be kept in good operating condition, future reserves must be developed to the fullest extent possible, and new exploration must be encouraged. While the mining industry, in the interest of national and world prosperity, favors maximum international trade in time of peace, such trade must not be stimulated at the expense of national security. Domestic mines must be protected by a tariff adequate to offset richer natural deposits, lower labor costs, lower exchange rates and the operation of cartels in foreign countries.

PUBLIC LAND POLICY

We oppose any expansion of the Government leasing system to cover public lands valuable for their metal content, to exact royalties and to extend the bureaucratic control of the General Land Office over the free enterprise of prospectors and locators who, for nearly a century past, have been responsible for the discovery and production of the valuable metal resources which have been the basis of our industrial development. Federal recording of location notices and proofs of annual labor should not be required.

We urge discontinuance of the present policy of the General Land Office in protesting applications for mineral patents in mining regions, and the technical and unreasonable requirements as to demonstrated mineral values prior to full development of the properties where the location of claims with respect to proven lodes and ledges is such that no reasonable doubt of this value for mineral purposes can exist. In this connection we urge a return to the former policy of encouraging the development of properties in such proven mineral areas through the liberal granting of patents.

We oppose the assumption by the General Land Office of the right to investigate and pass on the validity of metal mining locations before any application for patent is made. This is an unauthorized bureaucratic invasion of the miner's long-recognized statutory right to locate mining claims upon the unreserved public domain wherever the locator believes metals may be found in paying quantities.

WATER POLLUTION

We oppose legislation vesting control over water pollution in a Federal agency with power to set rigid standards and to force compliance through action in the Federal courts. Water pollution is a local problem, varying widely in nature and amount, and best dealt with by State and local authorities. Federal legislation on this subject

should be limited to the principles of the Spence Bill providing for scientific investigations and technical assistance to State and local governments and industries, supplemented where necessary by interstate compacts.

GOLD MINE RELIEF

We favor legislation to reimburse gold mine owners and operators for capital losses and unreimbursed maintenance costs (including State and Federal taxes and interest paid on obligations) where such capital losses and maintenance costs resulted directly or indirectly from compliance with Limitation Order L-208 of the War Production Board.

REHABILITATION LOANS

We recommend Congressional expansion of the authority of the Reconstruction Finance Corporation so as to specifically authorize loans in amounts sufficient to provide for the rehabilitation of gold mining properties which have been wholly or partially closed down through operation of Order L-208, and which contain proven ore bodies of a value equal to the loans required.

MONETARY POLICY

We continue to favor a currency with a metallic base, using gold and silver. We endorse the continued purchase and coinage of domestic gold and silver, as provided by law. We urge the repeal of the prohibitions on free circulation of gold, and the removal of the ceiling price on silver.

TAXATION

1. We commend the statement which Treasury Secretary Vinson has made (before the Ways and Means Committee, October 1, 1945) as to the first principle which should guide in constructing a tax program—

> *"Taxes should be levied in such a way that they have the least harmful effect on the expansion of business investment and the creation of jobs, because productive employment is the source of our standard of living, of all income, and of the revenue which the Government collects from taxes."*

We commend as important progress towards this standard the action of Congress in repealing the excess profits tax and the capital stock tax and the reductions made in other taxes to relieve the tax load on business and investment, together with the announced purposes of both Congress and the Treasury that further appropriate steps be taken in the ensuing session of Congress towards creating a postwar tax system which will leave adequate incentive for investment, for business activity, and for employment.

2. Among the features which should be embraced in that tax revision are the following:

The present corporate income tax rates should be further reduced. The higher individual surtax rates should be brought down to a point where they will not, as at present, be passing the point of maximum productivity. In taxation of dividends, full allowance should be made for corporate taxes already paid. Intercorporate dividends should not be again taxed, and dividends should be taxable to individuals only to the extent that the individual's tax rate exceeds the corporate rate. For individuals there should be an over-all ceiling so that in no case should the tax take more than 50 per cent of the taxable income. The corporate tax on earnings plus the stockholder's tax on dividends should in no case exceed 50 per cent.

3. In determining taxable gain, full allowance must be made for capital recovery and losses of loss years should be fully deductible in determining the income of past or future years which will be subjected to tax. Carry-back and carry-forward losses should be computed on the basis of using net income after deducting percentage or other form of depletion regularly allowed the taxpayer on income and excess profits tax returns for the year or years in which the losses were incurred. The taxpayer should be given every reasonable latitude as to amount and method of computing reasonable allowances for depletion and depreciation, and the tax benefit principle should be applied so that amounts will only be considered as theretofore allowed to the extent they resulted in a tax benefit to the taxpayer, or allowable to the extent they might have given a tax benefit. Costs of development, exploration and research should be allowed as part of the operating expenses of the mines.

4. The law should be framed and administered to safeguard the interest of taxpayers as much as to obtain revenue for the Government. There should be a real endeavor to have law and regulations, in substance and in expression, such that they can be reasonably understood by intelligent taxpayers. The administration of the law should be such as to carry out the Congressional intent, and should not be distorted by regulation or otherwise to deny to the taxpayer benefits extended by Congress. The Congressional intent as expressed in committee reports should guide the administrative officers.

Taxable net income should be brought as nearly as practicable to the standard of net income as

ordinarily understood, with time and nature of income accruals conforming as nearly as practicable to good accounting practice. There should be endeavor to get the law to a basis which might be expected with minimum change from year to year to set forth standards of income which could be considered applicable for a considerable period of years. Business enterprises and investors cannot proceed with confidence for the future without fair assurance of tax standards applicable.

5. The excise tax on freight which was adopted as a war revenue measure should be promptly repealed. It is a particularly burdensome cost on the mining industry.

6. While the excess profits tax has been repealed as to the future, there are points regarding it which should have consideration as to years subject to it. Particularly, the relief provisions of Section 722 seem to have bogged down and become of doubtful effectiveness. The law seems to require amendment to make these provisions effective unless that can otherwise be done through modification of Treasury regulations and procedure. The carry-back of unused excess profits tax has been continued for one year, but the full carry-back for two years should be allowed since this was one of the important conditions of the law as it stood applicable to excess profits tax years.

7. The rate of taxation is affected by the rate of governmental expenditures. Congress should appropriate funds only in relation to tax collections, and every effort should be made to reduce governmental expenditures. The level of such expenditures should be such that tax collections may be reduced so as to prevent Federal and State taxation from taking a disproportionately large proportion of the national income. Such a course is not only sound fiscal policy, but will operate to restrain inflationary influences.

FREE ENTERPRISE

Free, private, competitive enterprise—by whatever name it is called—is the basis of the American way of life. It has brought to America the world's maximum industrial production and highest standard of living.

Free, private, competitive enterprise requires:

The highest degree of personal freedom attainable under just laws impartially enforced.

Preservation of the incentive system.

Freedom to save and invest as we wish.

No arbitrary control by government.

The preservation of property rights.

Private, not government ownership.

No special privileges—for management, for labor, for capital.

Government by law and not by bureaucrats.

Retention of the sound principles voiced by the Declaration of Independence and the Constitution including the Bill of Rights.

No war economy now that the war is over.

The acceptance of competition for ourselves as well as for others.

Under this system—to which we wholeheartedly subscribe—American Industry, once the problems of conversion are fairly solved, can move forward with confidence, develop new frontiers through technical and scientific progress, and produce and distribute better goods in greater volume at lower prices to more people.

Only under a system of free, private, competitive enterprise can we restore and preserve individual freedom.

Wheels

(*Continued from page* 51)

there should be no legislation which would unduly interfere with the continuance of industry where a population is principally dependent upon it and where the wastes therefrom are not of material importance to other communities. The AMC counseled the committee against the provision of the Spence bill encouraging uniform State laws, stressing the fact that water pollution is a local problem. Warning was also sounded against the Spence bill provisions calling on the Surgeon General to recommend to State health authorities the bringing of suits against municipalities and industries within their States.

Gold and Silver

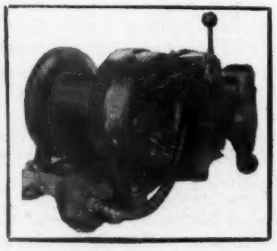
A bill introduced by Representative Clair Engle of California and in the Senate by Majority Leader Barkley of Kentucky for Senators Murray of Montana and Taylor of Idaho would authorize the President to fix the weight of the gold dollar at a rate not less than $35 per ounce and to fix the weight of the silver dollar "at a definite fixed ratio in relation to the gold dollar at such amounts as he finds necessary from his investigation to stabilize domestic prices or to protect the foreign commerce against the adverse effect of depreciated foreign currency." The bill would also restore the free circulation of gold coins and gold certificates and provide for coinage of $10, $20 and $50 gold coins and issuance of gold certificates, as well as authorizing payment in either gold coins or certificates for all gold bullion tendered to the Mints.

An interesting situation is created by the scarcity of silver for the manufacture of flatware and jewelry. The Green Act expires December 31. Senator Green has a bill in the Senate Committee on Banking and Currency which would extend the authority of the Treasury to sell silver to manufacturers for two years, but at a price of not less than 71.11 cents per ounce. In the same committee is Senator Pat McCarran's bill which would grant the price of $1.29 per ounce to domestic producers of silver. What may develop from this situation is difficult to predict but it bears potentialities of definite interest to the producers of silver.

FOR HOISTING
Timber, Steel, Powder or other Supplies

There's safety for all services—and peace of mind for operators—with this new Gardner-Denver HKK Safety Hoist! For the HKK is equipped with a spring-loaded brake, which is held in the off position by air pressure. If the air supply fails for any cause—if an air hose ruptures—or a line breaks—the brake is instantly and automatically applied. This brake will hold twice the load that the hoist will lift.

Here is another Gardner-Denver contribution to safety—and one which will appeal strongly to your safety engineers. For complete information about the Gardner-Denver HKK Safety Hoist, write Gardner-Denver Company, Quincy, Ill.



When the operator removes his hand from the control throttle, the brake is automatically applied and holds the load. Brake action is instant and automatic.

GARDNER-DENVER *Since 1859*

Personals

Fred Searls, Jr., vice president of the Newmont Mining Corporation, has been awarded the William Lawrence Saunders Gold Medal for 1946. The award was recommended by the Saunders Medal Committee of which **Cadwallader Evans, Jr.**, vice president of Hudson Coal Co., Scranton, Pa., is chairman. The medal recognizes "distinguished achievement in mining."

Mr. Searls' citation reads: "For outstanding ability and discernment in the practice of mining geology and in the appraisal and development of mineral deposits in many parts of the world; and for effective participation in the formulation of broad national policy in the prosecution of the war, thus bringing added distinction to himself and to the mining profession."

B. M. Rogers, assistant general superintendent, DeBardeleben Coal Corporation, was recently promoted to the position of general superintendent. **Earl H. Quick** has been made assistant general superintendent. Mr. Quick was formerly employed by the Atlas Powder Company in the technical division.

G. Moss Patterson, who has been director of the Kentucky State Bureau of Mines and Minerals, resigned October 1 to become affiliated with the engineering firm of Robinson and Robinson, Charleston, W. Va. Mr. Patterson will open an office in Lexington, Ky., where he will make his headquarters.

Harold B. Wickey, who has been serving as deputy chief of the coal section of the mining division, War Production Board, has been appointed chief of this section, succeeding **John L. G. Weysser** who resigned recently.

Appointment of **Reid B. Gray** as director of the Reynolds Research Institute, research subsidiary of the Reynolds Metals Company, is announced by **R. S. Reynolds**, president.

Mr. Gray succeeds **Dr. Warren J. Mead**, who has resigned to give more attention to his duties as head of the geology department, Massachusetts Institute of Technology.

The marriage of **Raymond E. Salvati**, vice president of Island Creek Coal Co., and **Miss Beatrice Rohlf** of New York City took place in New York on October 6. After a trip to Sea Island, Ga., Mr. and Mrs. Salvati will be at home in Huntington, W. Va.

F. S. Norcross, Jr., has been elected vice president of the Freeport Sulphur Company, **Langbourne M. Williams, Jr.**, president has announced. Mr. Norcross, who is president and general manager of Freeport's manganese mining subsidiary, will participate also in the company's expansion activities. Mr. Norcross built the manganese ore concentration plant in Cuba and has been in charge of its operation from the beginning.

F. S. NORCROSS, JR.

Prior to joining Freeport, Mr. Norcross was affiliated with mining and metallurgical activities in many parts of the Western Hemisphere, including Canada, Mexico, and the western United States. He graduated from the University of Michigan in 1906 and from the Michigan School of Mines in 1908, and also served with the 27th U. S. Engineers in the First World War, retiring with the rank of major.

M. K. Clay has been appointed maintenance superintendent of the Harwood mine of the Semet-Solvay Company, Longacre, W. Va. He was formerly chief electrician, Raleigh Coal & Coke Company, Raleigh, W. Va. Mr. Clay has been secretary-treasurer of the New River & Winding Gulf Electrical and Mechanical Institute for a number of years and is now a member of its executive committee.

John J. Lincoln was recently presented with a fine watch and chain suitably inscribed in recognition of his 43 years' connection with the Pocahontas Operators Association. Mr. Lincoln was a founder and the first secretary of the association. He has in turn been a member of the executive committee, treasurer, and president from 1932 to 1945. He is now chairman of the executive committee. Presentation of the award was made by resident members of the executive committee: **William Beury**, vice president of the association; **Henry F. Warden**, treasurer; **H. C. Faust, R. C. Luther** and **W. E. E. Koepler**, secretary.

Stockholders of International Minerals & Chemical Corporation have elected **Thomas S. Lamont, Gen. Robert E. Wood** and **R. Douglas Stuart** directors of the corporation, according to an announcement by **Louis Ware**, president.

Mr. Lamont, vice president of J. P. Morgan & Co., Inc., will fill the vacancy caused by the resignation of his father, **T. W. Lamont.**

With the election as directors of Gen. Wood, chairman of the board of Sears, Roebuck and Company, and Mr. Stuart, president of The Quaker Oats Company, both of Chicago, International's board has been increased from seven to nine members.

Charles H. Dodge, who until recently was a major assigned to the Office of Civilian Defense of the Army and who returned to civilian duties as a coal mine inspector in 1944, has been appointed engineer in charge of the Jellico, Tenn., station of the coal mine inspection service, Federal Bureau of Mines. He was transferred there from the Mt. Hope, W. Va., station in September.

Charles V. Woodard is now at Metaline Falls, Wash., as chemist for the American Zinc, Lead and Smelting Company. He was formerly assistant safety engineer for the Bunker Hill and Sullivan Mining and Concentrating Company.

Rufus Bailey, formerly district mine inspector at Harlan, Ky., has been appointed general mine foreman for the Four Seam Mining Company, at Diablock, Ky.

The Marquette Range Engineers' Club, at its November meeting, elected the following officers for the coming year:

Joe C. Cameron, president; **Clyde T. DeHaas**, vice president; **Peter P. Ribotto**, secretary; **Frank D. Masek**, treasurer; **L. C. Moore, C. W. Nicolson** and **A. Syverson**, directors.

M. Albert Evans, assistant to the vice president, Koppers Coal Division, Eastern Gas and Fuel Associates, has announced that **M. L. Workman**, general superintendent of the Long Branch, Helen and Stotesbury No. 8 and 11 mines, became general superintendent of the Keystone, Carswell and Maitland mines on November 1. His office will be at Kimball, W. Va.

He will be succeeded by **S. H. Thatcher**, superintendent of Federal No. 3 mine. Mr. Thatcher's headquarters will be at Glen White, W. Va.

J. O. Davis has been appointed acting superintendent of Federal No. 3 mine and **E. H. Shaw** has been made superintendent of Long Branch mine. Mr. Shaw replaces **A. E. Barrett** who has asked for a leave of absence.

H. John Harper, assistant to the vice president, has announced that in his division **A. P. Boxley**, superintendent at Kopperston mine, has been appointed general superintendent of the Weeksbury, Wharton and Kopperston mines with headquarters at Kopperston. **Cleophus Short**, Kopperston mine foreman, succeeds Mr. Boxley as superintendent at Kopperston.

Charles T. Limerick, general superintendent of Vermont Asbestos Mines, has been appointed chief engineer of The Ruberoid Co. with headquarters at the Ruberoid plant at Bound Brook, N. J. **I. Morgan Potter**, formerly chief assistant to Mr. Limerick, has been named to succeed him as general superintendent of the company's Vermont operations, according to announcement by **Walter G. Cowan**, vice president in charge of manufacturing.

Effective October 1, 1945, **Clifford G. Strote** was appointed purchasing agent for the H. C. Frick Coke Company, the United States Coal and Coke Company, and their associated companies, succeeding Mr. George W. Brown, retired, according to announcement by **Harry M. Moses**, president.

Louis S. Cates, president of Phelps Dodge Corporation, has been elected president of the American Institute of Mining and Metallurgical Engineers

for 1946. Mr. Cates will be formally inducted into office at the annual meeting to be held at the Palmer House in Chicago, February 25-28.

Donald J. Reese, nead of the Iron and Non-ferrous Castings Section of the Development and Research Division of The International Nickel Company, Inc., in New York, was presented with a "Tribute of Appreciation" award "for distinguished service to the Government and the gray iron foundry industry" by the Gray Iron Founders' Society, national association of manufacturers of engineering gray irons, at the trade group's 17th annual covention in Chicago, October 23.

Harold A. Holbrook, field representative for Anthracite Industries, Inc., in the New England territory, has returned to his field duties after three years' service in the Navy. He had been with the anthracite organization since 1937 and prior to that time was engaged in the coal trade publishing field.

L. Kenneth Wilson, geologist for American Smelting and Refining Company and formerly stationed in Salt Lake City, has been appointed Chief Geologist for the Southwestern Mining Department, 813 Valley National Building, Tucson, Ariz. W. H. Loerpabel is general manager of AS&R's operations in the southwest states.

Donn M. Clippinger has joined the Mining Division of the New Mexico State Bureau of Mines and Mineral Resources. He graduated from the New Mexico School of Mines in 1943, and since that time had been control engineer and surveyor with Kennecott Copper Corporation at Ray, Arizona.

R. P. Tyler, general sales manager for the Macwhyte Company, was elected October 12 to the board of directors to fill a vacancy caused by the resignation of **Mrs. George S. Whyte.**

Robert M. Hatfield has resigned as deputy vice chairman of the War Production Board to become assistant general sales manager of Combustion Engineering Company.

Elmer C. Salzman, vice president in charge of export operations, Robins Conveyors Inc., left October 12 en route to the company's London office.

Salzman will spend several months in England to bring activities up to the same scale as before the war and to survey the need for Robins equipment in connection with rebuilding war damaged areas.

The company also announces the appointment of **Hugh Avery** as personnel director.

Mr. Avery was recently in charge of employment at the Lake Erie Engineering Corporation, Buffalo, N. Y.

The resignation of Deputy Solid Fuels Administrator **Charles J. Potter** has been accepted by **Secretary Harold Ickes**, and **Dan H. Wheeler** has been appointed as Potter's successor. Dr. Potter has also resigned as Chairman of the Coal Committee of the Combined Production and Resources Board. He will return to his home in Indiana, Pa., to devote full

time to his position as Assistant to the President of Rochester & Pittsburgh Coal Company.

Dr. Potter carried the responsibility for maximum coal production and its proper distribution to war industries and civilians, contributing an extraordinary understanding of the problems as well as a tremendous capacity for work and ability to secure cooperation, thereby performing a service of the highest order to the successful prosecution of the war.

Guy J. Coffey, manager of the West Coast office of Chicago Pneumatic Tool Co., was recently appointed vice president in charge of sales. He joined the organization in 1933.

The Fairmont Coal Bureau has announced the employment of **Carl A. Marshall** as Fuel Engineer to assist in its expanded program. Just relieved from active duty as a Major in the Corps of Engineers, U. S. Army, Marshall recently returned from the European theater where he served as Chief of the Petroleum and Fuel Branch, United Kingdom Base. Prior to the war he was fuel engineer for Consolidation Coal Company.

Charles S. Burriss has resigned his position as assistant mining engineer for the Anaconda Copper Mining Company and has accepted the position of chief engineer and geologist with the American Smelting and Refining Company at its Mike Horse mine, Mike Horse, Mont.

The appointment of **William F. Hahman** as Assistant Deputy Solid Fuels Administrator for War to handle distribution and transportation matters pertaining to all solid fuels has been announced.

Mr. Hahman has been serving since the organization of the Solid Fuels Administration for War, in 1943, as Chief of the Bituminous Distribution Division. He was succeeded in that office by **William G. Caperton**, the former Assistant Chief.

S. E. Zelenkov, who has been superintendent of American Smelting and Refining Company's Boston Consolidated mine at Bingham Canyon, Utah, has been named superintendent of the Leadville-Kokomo units with headquarters at Leadville, Colo.

Joseph P. Ruane has been named by Governor Martin of Pennsylvania to succeed the late Frank B. McGovern as an anthracite mine inspector. Mr. Ruane was formerly mine foreman for the Racket Brook Coal Co., safety director for the De Angelis and Northwest Coal companies, and lately on the U. S. Bureau of Mines staff at Pittsburgh.

Paul A. Bundy will again be associated with the Bradley Mining Company with headquarters at Nevada City, Calif. He has been engineer in charge of equipment and machinery problems in connection with the U. S. strategic metals production and purchase programs for Peru, Bolivia, and Chile, with Metals Reserve Company and the Foreign Economic Administration.

Appointment of **Dr. Lawton A. Burrows** as assistant manager in charge of research, technical division of the explosives department, is announced by E. I. du Pont de Nemours & Company.

He succeeds **Dr. W. E. Lawson,** a former director of Eastern Laboratory, Gibbstown, N. J., who is assigned to special duties. **Dr. Wesley M. Nagle** was appointed assistant director at Eastern Laboratory.

Colonel Louis C. McCabe, recently returned from the European theater, is to be in charge of mining operations and coal procurement for the American Gas & Electric Co., of New York.

Edwin E. Hand, Jr., metallurgical chemist for the U. S. Vanadium Corporation, will return to the Bishop, California unit. He has been at the company's Durango, Colorado, unit since January, 1945.

Carrol E. Craven, formerly mill and smelter superintendent for Mammoth-St. Anthony, Ltd., at Tiger, Ariz., has joined the Calco Chemical Division of the American Cyanamid and Chemical Corporation at Piney River, Va.

Appointment of **G. V. Woody** to succeed **R. C. Newhouse** as manager of the Allis-Chalmers basic industries department November 1 has been announced by **W. C. Johnson,** vice president in charge of the company's general machinery division. Mr. Newhouse, who will be retained as a consulting engineer, retires after more than forty years as engineer, inventor and designer of some of the world's largest cement and mining machinery.

L. C. Campbell, vice president, Koppers Coal Division, was recently elected to the board of directors of National Coal Association. He fills a vacancy caused by the resignation of **J. P. Williams, Jr.,** whose duties have so changed that he is no longer directly connected with the coal industry. Mr. Williams has served as president of the Association.

LeRoy Keane has been appointed director of sales of the explosives department, Hercules Powder Company, effective October 1. He succeeds **C. C. Gerow,** who has been director of sales since 1919.

John M. Martin has been appointed manager of the Pittsburgh, Pa., explosives office to succeed Mr. Keane. He was formerly operating manager of the Hercules-operated Sunflower Ordnance Works in Kansas.

John C. Leppart has been appointed assistant to the operating vice president of the Southern Alkali Corporation, Corpus Christi, Texas. Southern Alkali is owned jointly by Pittsburgh Plate Glass Company and American Cyanamid and Chemical Corporation.

William F. Pellens, Virginia, Minn., general superintendent of the Virginia-Eveleth district mines of the Oliver Iron Mining Co., retired October 1 after completing 41 years of service with the company. He is succeeded by his assistant, **William F. Kaiser.** Mr. Kaiser has been with the company since 1906, advancing to the position of assistant general superintendent in November, 1939.

— *Obituaries* —

Joseph Becker, vice president in charge of Engineering & Construction Division, Koppers Company, Inc., Pittsburgh, has been notified by the War Department that his son, **2nd Lt. John J. Becker,** who was reported missing in action September 27, 1944, now is officially listed as killed. Lt. Becker, a bombardiar-navigator on a B-24 Liberator bomber, was lost when his plane, blown off course by high winds while returning from a mission, was shot down by enemy fighters near Hersfeld, Germany.

Frank C. Angle, manager of the general machinery division field sale offices, Allis-Chalmers Mfg. Co., Milwaukee, Wis., died October 25 after an illness of several months.

Mr. Angle, who was 45, has been field sales manager since 1944. He joined Allis-Chalmers in 1929 as a salesman in the Chicago office.

John J. Roberts, 72, retired president and one of the founders of Roberts and Schaefer Company, Chicago, Ill., died November 3 in Miami, Fla. He was born in Sadoris, Ill., and attended the University of Illinois.

The funeral service was conducted at Miami by George R. Delamater, First Reader, First Church of Christ Scientist, Fort Lauderdale, Fla.

Walter A. Staub, 69, accounting and tax authority and senior partner of Lybrand, Ross Bros. & Montgomery, died in New York November 4. He was author of several books on accountancy and Federal tax subjects including "Income Tax Guide" (1915), "Consolidated Returns on Federal Income Taxes" (1921), and "Auditing Developments During the Present Century" (1942), as well as a number of others.

A. J. Musser, 71, vice president and general manager of the New York Central Railroad Company's Mining Department, died November 8, at his home in Indiana, Pa. Mr. Musser was a prominent figure for nearly half a century in the coal industry in Central

Pennsylvania, and for eight years has been identified with operations in Central Pennsylvania and Illinois. He was vice president of the Clearfield Bituminous Coal Corporation, operating in Ohio, and was also vice president of the Central Pennsylvania Coal Producers Association and a member of its Board of Directors.

Selwyn G. Blaylock, 67, chairman and former president of Consolidated Mining and Smelting Co., died at Trail, B. C., November 19. Mr. Blaylock was a leading metallurgist both in Canada and the U. S. He was with his company 44 years.

Oliver M. Shosted, 58, field engineer for Combined Metals Reduction Co. for the past 22 years, died October 10 at Bingham, Utah. He was identified with many of his company's developments.

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NEWS and VIEWS

Two young ladies of Cripple Creek, Colo., solve transportation difficulties with the aid of a friendly little burro

Eastern States

Recognition For Mining Industry

Under the caption "Postage Stamps," Dean Steidle, of Pennsylvania's School of the Mineral Industries, Pennsylvania State College, makes the following pertinent suggestion in a recent issue of the School's publication, *Mineral Industries*:

The stamp collectors of the United States number in the millions, both young and old. During the past ten years there has been a constant flow of new issues commemorating about everything in an historical or personal manner that has happened in the country. Conspicuous omission, especially considering present day mineral consciousness, has been anything relating to the mineral industries. In fact, the only United States issue on the records is the 50-cent Trans-Mississippi issue of 1898 on which was depicted a prospector.

Postmaster General Hannegan wrote this office in part under date of September 11, 1945:

"A field as broad as that represented is rather difficult to effectively handle by means of a postage stamp, though some particular phase might be treated should an appropriate occasion be offered. I was rather hopeful that the 200th anniversary of the coal industry which occurs this year, the celebration of which was foregone because of wartime conditions, might offer such an opportunity.

"I am glad that you have brought the subject to my attention as a rather neglected field from the standpoint of commemorative postage recognition for such consideration as the future may afford."

Third Assistant Postmaster General Lawler wrote this office in part under date of October 8, 1945:

"A record has been made of the anniversary dates regarding the discovery of gold in California and the drilling of the Drake well in Pennsylvania for consideration in connection with future commemorative stamp programs."

I believe that a series of stamps on the mineral industries would be of great service to our citizenry at this time. The United States Bureau of Mines has indicated that minerals furnish 60 to 70 per cent of the primary wealth in the United States. The various issues would be supported by the localities concerned. It is understood that the first-day issue of new stamps is sold at the point most closely concerned with the event and first-day covers properly postmarked increase in value.

We should start something in this direction now. Many of the other countries have given due attention to the mineral industries in their stamp issues; for example, several South American countries have shown oil wells, German blast furnaces, etc. In addition to historical events, issues should be dedicated to the principal mining states. There should be a series of stamps for the precious metals, base metals, light metals, mineral fuels, as well as the more important non-metallic industrial minerals.

I trust that there is sufficient interest in the movement whereby active support will be given by our major mineral industries societies, technology, managment, labor, which, in turn, can line up certain political interests. Senators from the western mining states would be sure to go along, as well as representatives from the east where minerals are important. Perhaps our leading mineral industries periodicals representing all interests will be inclined to run articles with releases to local press where desirable.

New 5,000-Ton Mine to Open

Work has begun on the opening of a new bituminous mine in Spangler, Pa. The Springfield Coal Corporation, an affiliate of Peale, Peacock & Kerr, Inc., New York, in opening the new mine is tapping an area of about 17,000 acres of coal land. The new operation will be modern in every respect. The company has two mines at Nanty-Glo, Cambria County, and one at Wilson Run, Clearfield County. Construction has been started on a tipple, one slope has already been opened up and work has been started on a second slope. The mine is being laid out to produce 5,000 tons of coal a day when it gets into full operation.

Hold Up Enforcement of Strip Mining Law

Two lawsuits have already been filed and a third is contemplated against Pennsylvania's attempt to regulate strip mining. These suits have been filed in the Dauphin County Court. State officials have held up enforcement of the 1945 strip mining

law pending disposition of these cases. The Elba Coal Co., of Madera, in Clearfield County, has joined an attack on the constitutionality of the law, brought by Alexander Dufour, who also operates in Clearfield County. William M. Rutter, Deputy Attorney General, states that he has been informed that a third suit would soon be brought and when all the cases were in there would be a request by counsel for the Dauphin County Court to hold a combined hearing covering all three cases.

Mine School Movement Grows

The training-for-mine-work program sponsored by the Lehigh Valley Coal Company, Wilkes-Barre, Pa., has received considerable praise and strong endorsement by the U. S. Bureau of Mines, local inspectors of the Pennsylvania Bureau of Mines, as well as many local mine union officials. The training program recently begun at Wilkes-Barre and Pittston has been so successful that special training for prospective mine employes has now been extended to the Scranton, Dallas, Berwick, Shickshinny and Tunkhannock offices of the U. S. Employment Service. Manpower Commission officials state that mine manpower shortage is so acute that all able-bodied men, who have filed claims for State unemployment compensation after layoffs, should be granted a reasonable time to obtain other employment, either by their own efforts or through the facilities of the U. S. Employment Service. If still unemployed after a reasonable length of time, these men will be denied unemployment compensation unless they are willing to accept mine work. Farmers living in rural areas near mines have been appealed to for work assistance, even on a part-time basis, to reduce this manpower shortage.

ESTIMATE OF BITUMINOUS COAL REQUIREMENTS FOR INDUSTRY

DURING THE COMING THREE YEARS OF RECONVERSION FOR THE MANUFACTURE OF A FEW DESIRED COMMODITIES

Commodity	Number of Units Estimated to Be Manufactured	Approximate Coal Required Per Unit Pounds	Total Coal Required Tons
Passenger cars	15,000,000	1,500	11,250,000
Trucks	5,000,000	2,200	5,500,000
Tractors	1,000,000	2,000	1,000,000
Motorcycles	1,000,000	750	375,000
Bicycles	2,000,000	100	100,000
Deepfreezers	500,000	500	125,000
Refrigerators	8,000,000	500	2,000,000
Washing machines	6,000,000	400	1,200,000
Sewing machines	5,000,000	100	250,000
Vacuum cleaners	6,000,000	100	300,000
Radiators	15,000,000	50	375,000
Electric fans	1,000,000	40	20,000
Ranges	2,000,000	500	500,000
Stoves	5,000,000	200	500,000
Electric irons	15,000,000	25	187,500
Toasters	5,000,000	10	25,000
Pressure cookers	1,000,000	50	25,000
Clocks—watches	30,000,000	20	300,000
Radios	20,000,000	100	1,000,000
Pianos	1,000,000	1,000	500,000
Locomotives	5,000	200,000	500,000
Passenger cars, railway	20,000	50,000	500,000
Steel rails	10,000,000	1,000	5,000,000
Construction commodities for new homes	5,000,000	50,000	125,000,000
Business buildings	10,000	20,000,000	100,000,000

—Bituminous Coal Institute

To Purchase Pennsylvania Plant

The Westinghouse Electric Corporation, Pittsburgh, Pa., announced recently it would purchase property and buildings in Meadville, Pa., for the production of industrial heating equipment.

The property, comprising more than five acres of land and five major buildings with more than 100,000 ft. of floor space, is being purchased from Talon, Inc., after the boards of directors of both companies approved the sale, according to L. B. McCully, manager of the Westinghouse Transportation and Generator Division.

"The entire Westinghouse line of industrial heating equipment will be produced in the Meadville plant. This includes many types of furnaces and other devices for heat-treating, driers, immersion heaters, space heaters and thermostats."

Westinghouse will employ from 150 to 200 persons in this new production unit, it was stated. The reconversion and remodeling of the plant will be begun immediately and production should be well under way by mid-January.

Mr. McCully emphasized that the shifting of this manufacturing from the East Pittsburgh works and the Mansfield, Ohio, plant of the Electric Appliance Division would not affect total employment in either of these locations.

"Mansfield's heavy expansion of appliance production made the continued manufacture of thermostats, immersion and space heaters impossible," he explained. "At the East Pittsburgh works increased activity in other lines of production by this division will more than make up for the transfer of the industrial heating manufacture."

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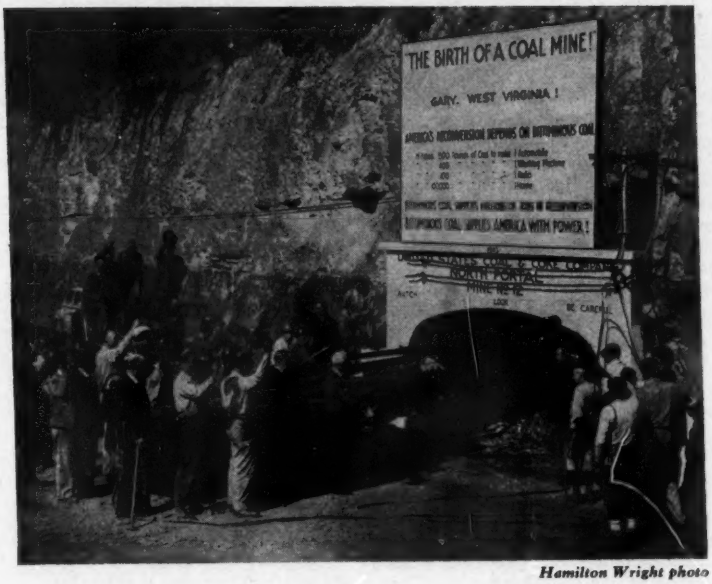


Hamilton Wright photo

U. S. Steel Subsidiary Opens New Coal Mine

The U. S. Coal & Coke Company, U. S. Steel subsidiary, has opened a new coal mine high on Elkhorn Mountain, near Gary, W. Va.

The mine is 2,200 ft. above sea level, and an incline 1,000 ft. long on a 50 per cent grade, is used to take coal to railway cars at the bottom of the mountain.

U. S. Steel spokesmen report that the new mine, expected to produce 1,200 tons a day, is an important step forward in its reconversion program.

The mine's output, along with that of other mines in the Pocahontas field, will be used in the Chicago, Lorain, Ohio, and Cleveland coking plants. None of the coal will be allocated to Pittsburgh district plants, according to the announcement by U. S. Steel officials.

Annual Meeting West Virginia Coal Mining Institute

The 38th Annual Meeting of the West Virginia Coal Mining Institute took place at the Hotel Morgan and in the Mineral Industries Building at Morgantown, W. Va., on November 9.

The meeting was opened by J. J. Foster, chairman of the morning technical session who introduced Lt. Col. Carl M. Mabley, U. S. Army, Service of Supplies, Washington, D. C., who spoke on "The Coal Situation in Europe." Col. Mabley has an outstanding war record and for his excellent services was recently decorated with the Bronze Star. Dunlap C. Brady, mining engineer, Baltimore & Ohio Railroad Company, Summersville, W. Va., spoke on "Report on the Nicholas-Webster County Coal Field." These two excellent papers were followed by a business session presided over by President Laurence E. Tierney, which was in turn followed by a luncheon in the ball room of the Hotel Morgan. Fred S. McConnell, president, National Coal Association, and president and general manager, Enos Coal Mining Company, Cleveland, Ohio, was guest speaker.

The afternoon session was presided over by R. H. Morris. First speaker on the afternoon program was Carel Robinson, of Robinson & Robinson, consulting engineers, Charleston, W. Va., who discussed "Planning the Mining Layout for Mechanical Mining." This was followed by a paper jointly presented by S. R. Pursglove, personnel manager, Pursglove Coal Mining Company, Pursglove, W. Va., and Dr. Quin F. Curtis, associate professor of psychology, West Virginia University, whose subject was "Is There a Guide to Effective Pre-Employment Selection of Coal Mine Workers?"

Following a social hour at the ballroom in the Hotel Morgan at which the ladies were guests, the annual dinner was held with Arthur B. Koontz, Charleston, W. Va., as toastmaster. The guest speaker was the Hon. James G. Stewart, mayor, City of Cincinnati, Ohio. An informal dance followed the dinner.

New Mine In Concord Area

The Tennessee Coal, Iron & Railroad Company, subsidiary of the United States Steel Corporation, is reported as making preparations to open a new coal mine in the Concord area of Alabama. The new mine will produce an estimated 4,200 tons of coal daily at ultimate capacity. The mine will have a 2,200 ft. hoisting slope, a 1,400 ft. material and supply slope, a shaft 18 ft. in diameter with 9 miles of underground railroad haulage facilities and the customary surface equipment. The company is also planning improvements which will increase the output of its Edgewater and Short Creek mines. The Fairfield coke works will have a new battery of 63 modern coke ovens installed which will replace one of the older batteries which is to be removed when the new battery is completed. Work on this project, now beginning, is expected to require 18 months for completion.

Alabama Requires Strip Pit Drainage

According to a ruling recently handed down by Attorney General Robert B. Harwood, of Alabama, companies or persons engaged in strip mining in that State must drain the pits left by their work in order to eliminate mosquito-breeding conditions. Mr. Harwood also stated that the State Health Department possessed authority to enforce rules requiring the drainage of all pits likely to impound water which would endanger the public health.

Holding Down Accident Costs

J. E. Rollins, vice president, Bituminous Casualty Corp., Rock Island, Ill., speaking recently at a meeting of the Cumberland Valley Mining Institute, at Middlesboro, Ky., stated "Whether we like it or not the burden of holding down accident cost is the responsibility of management." He asserted that serious and costly accidents can be reduced by intensive application of safety practices and that constant safety preaching and practice are necessary to maintain progress. This, he said, is proved by the fact that individual mines and in some cases whole districts have made progress through campaigns by safety organizations and mine managements for certain periods but these units have dropped back to their old averages when the drives eased up.

The Cumberland Valley Mining Institute was just recently organized and is now getting well under way. Two hundred men attended the Mid-

dlesboro meeting. C. B. Burchfield is president; D. A. Perkins, first vice president; Clarence J. Burton, second vice president; and Thomas Crutchfield, secretary-treasurer. Directors are: Dick Williams, Lee Rennebaum, Earl Lewis, J. P. Upchurch, and Claude R. Matthews.

Mine Ventilation Features Kentucky Meeting

L. W. Huber, district manager, Mine Safety Appliances Co., Lexington, Ky., recently talked to the Kentucky River Mining Institute on Mine Ventilation. The meeting was well attended and during the course of business John Mayhew, superintendent, Blue Diamond mine of the Blue Diamond Coal Co., Perry County, Ky., was elected president, with other officers as follows: First vice president, Warren Haydon, superintendent, Hardy-Burlingham Mining Co.; second vice president, W. E. Pendleton, manager, Kentucky Blue Grass Mining Co.; secretary, J. B. Allen (re-elected for the 15th year). The Executive Committee is composed of John M. Woods, superintendent, Glomawr mine, Hatfield-Campbell Creek Coal Co.; H. M. Gallehar, superintendent, Harvey Coal Corp.; P. A. Grady, general superintendent, Carrs Fork Coal Co.; R. C. Watts, superintendent, Kenmont Coal Co.; and M. A. Emmons, manager, Meem-Haskins Coal Corp. The Kentucky River Mining Institute was organized January, 1926, and has held the following objectives: to prevent accidents; to prevent willful waste of materials; to prevent willful waste of time; to promote better preparation; and to give each member the benefit of discussions or plans leading to lower costs of mining.

Wickwire Spencer Buys Coburn Trolley Track Company

THE Wickwire Spencer Steel Division of the Colorado Fuel and Iron Corporation has announced the purchase of the business and assets of the Coburn Trolley Track Company of Holyoke, Mass. The steel company will immediately assume full control of all management, production and sales operations of Coburn.

The Coburn Trolley Track Company manufactures hardware for sliding doors, garage, warehouse, automatic fire and overhead doors and hardware for overhead conveying equipment.

The purchase of Coburn is in line with Wickwire Spencer's policy of expansion to include the manufacture of products and lines closely related with the company's own wire and wire products.

In connection with the new property, Wickwire Spencer announced that it will be known as the Coburn Division. Operations will continue for the present at Holyoke, where Coburn's manufacturing plant and sales offices are located.

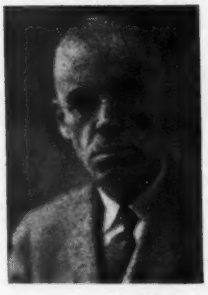
Stockholders of Colorado Fuel & Iron Corporation recently approved a merger plan with Wickwire Spencer Steel Company.

The merger plan was under negotiation for some time, but action had been delayed by postponements of the stockholders' meeting.

Stockholders of the Wickwire Company voted overwhelmingly last September 20 in favor of the merger.

Ends Five Years' War Service

With the passing of the War Production Board on November 3, Dr. C. K. Leith ended more than five years of war service in Washington. He was the first man in the mineral field



C. K. LEITH

to be called to Washington in June, 1940, by E. R. Stettinius, Jr., to help in the establishment of the Advisory Commission to the Council of National Defense, and he and Vice Chairman W. L. Batt are the only survivors of the original Commission to remain until the end of WPB.

Dr. Leith organized the minerals staff of the Defense Council in its early stages and remained as a consultant on minerals through its various progressions from the Advisory Commission, to the Office of Production Management, the Supply Priorities and Allocations Board, and finally the War Production Board. He particularly directed the research work on metals and minerals sponsored by these agencies. This has resulted in nearly 450 reports which have been used in the planning of an immense variety of mineral war projects.

Dr. Leith has become involved in certain postwar mineral activities which will keep him in Washington (Wardman Park) during the winter, although he has retained his office at the University of Wisconsin for summer use, as emeritus professor.

I don't know who she is—she comes down for a bucket of coal every morning

Central States

U. S. Bureau of Mines to Resume Drilling

Drilling projects of the U. S. Bureau of Mines in the Tri-State mining field, which had been discontinued under a reduced appropriations budget, will be continued, according to Otto Ruhl, project engineer in the Joplin operations office of the Bureau.

Drilling operations will be resumed on three projects, those on the Winchester land in Newton County south of Joplin, on the Wayland land, a mile and one-half southwest of Galena, and in the Melrose district, west of Picher along the Kansas-Oklahoma State line.

One rig will be used on each of the three projects at first and the number of rigs will subsequently be increased to about six in all, Ruhl reported.

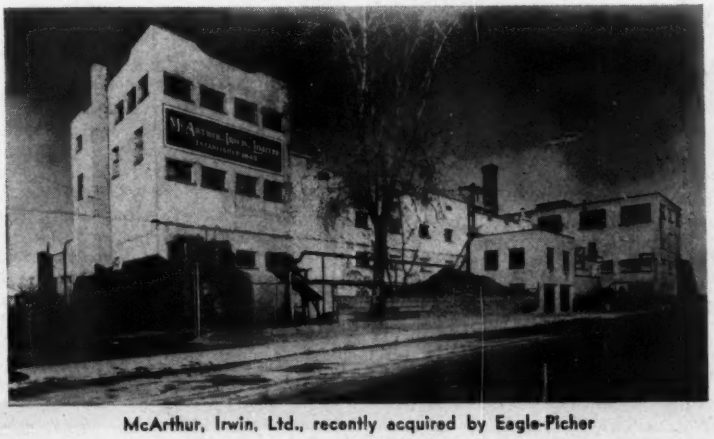
Eagle-Picher Expansion

Financial and trade circles in this country and Canada are especially interested in the recent announcement by Mr. J. M. Bowlby, president of the Eagle-Picher Company, of the acquisition of a substantial interest in the common shares of McArthur, Irwin, Ltd., by Eagle-Picher. "This stock purchase represents another forward step in the postwar expansion program of Eagle-Picher," declared Mr. Bowlby, "and marks the active interest of Eagle-Picher in the lead business of our Canadian neighbor."

Mr. Bowlby pointed out that McArthur, Irwin, Ltd., also manufactures colors, including chrome yellows, zinc yellows, barium chromate, chrome green, iron blues, tolindine and para reds. The Canadian firm has its headquarters and main plant in Montreal, where it also operates a large research laboratory.

Plans are being formulated now for the expansion of McArthur, Irwin, Ltd., into the manufacturing and marketing of litharge and red lead besides increasing the company's present white lead business. Application permits for additional plant buildings to house these new operations have already been issued and construction should soon begin. With this broadened line of lead pigments and oxides to offer Canadian industry, McArthur, Irwin, Ltd., will serve not only the paint field, but the rubber, storage battery and ceramic industries as well. Such an operation, in Canada, would partly parallel Eagle-Picher's own activities in the United States.

Considerable export business is also carried on with other members of the British Commonwealth by McArthur, Irwin, Ltd. This new plant and product expansion should help increase the Canadian company's export business substantially since it will be in an excellent position to serve the raw material needs of many more industries in the Empire. At the same time, this expansion will enable Eagle-Picher, through its substantial holdings in McArthur, Irwin, Ltd., to participate in the stepped-up industrial activities of Canada and the British Empire as they pertain to lead oxides and pigments in the paint, rubber, storage battery, ceramic and chemical trades.



McArthur, Irwin, Ltd., recently acquired by Eagle-Picher

In the past four years, Eagle-Picher has acquired holdings of other nonferrous metals companies in Kansas City, Dallas and Cleveland. In addition, extensive mining properties have been recently opened in Arizona, in Nevada, and in Taxco, Mexico.

New Shaft to Be Sunk

Preparations are being completed by the C. G. & C. Co. for the sinking of a new shaft on the Potter ranch a half mile west of the Oak Hill Golf and Country Club west of Joplin, Mo.

Geo. W. Potter, of Joplin, owner of the ranch, who was executive vice president of the Eagle Picher Mining & Smelting Co. for many years, has had a drill rig prospecting in the immediate vicinity of the shaft site for some time. A comparatively shallow run of zinc ore, from 80 to 110 ft. in depth, has been blocked out along the brow of a low hill.

Several holes were put down in good ore near the shaft site and a small well or lift pump has been installed in one of these. A 4-in. Pomona pump will be installed in another drill hole to supplement the other pump in dewatering the ground. A new roadway is being built.

Building of a sinking derrick is under way and the shaft will be put down to a depth of about 135 ft. It is planned to sink the shaft 20 or 25 ft. deeper than the ore body so the ore can be dragged into an underground hopper, according to A. W. White, of Miami, who is superintendent of the company. The drilling indicates that the ore lies in a soft ground formation, White said.

Associated with Potter in the company's development are Chas. A. Neal and G. C. Niday, both of Miami.

American Bridge to Expand Facilities

Broad plans for modernization of the Gary, Ind., plant of the American Bridge Company to meet increasing demands for fabricated steel in mid-western and western states have been announced by L. A. Paddock, president of this United States Steel Corporation subsidiary. The modernization project is a part of a long-range program begun during the pre-war years by subsidiary companies of U. S. Steel.

The Gary plant of American Bridge Company, which is adjacent to the Gary works of Carnegie-Illinois Steel Corporation, another member of the U. S. Steel family of companies, was built in 1911. During the war the plant built aircraft carrier subassemblies and radar equipment for the Navy, and earth-moving equipment which speeded construction of new

bases all over the world. In peacetime, the plant will turn out structural steel for all types of steel construction.

Output of the Gary plant of American Bridge Company is expected to be substantially increased by the changes which are planned, Mr. Paddock said. Working area of the plant will be increased by nearly 10 per cent, and rearrangement of fabricating facilities and production equipment, increase and centralization of the welding area, enlargement of the under-roof painting area and relocation and combination of certain service facilities are designed to improve postwar operations and service to customers.

Offer to Purchase Cleveland Pneumatic Tool

Lieut. Col. Walter E. Schott and his brother, Harold, prominent industrialists of Cincinnati and Cleveland, have made an offer of approximately $4,150,000 for the Cleveland Pneumatic Tool Company and the deal will go through shortly, it is indicated.

The Schotts and associates own 17 companies in Ohio, New York and West Virginia, including the U. S. Compressor Company of Cleveland. Colonel Schott, who served in the Army Ordnance Department in Cleveland and Washington during the war, recently sold his interest in the Columbia Axle Company in Cleveland.

Metal Powder Association Meets

At the 1945 annual meeting of the Metal Powder Association, held recently at the Netherland Plaza Hotel, Cincinnati, Ohio, David N. Burruss, Jr., Metals Refining Company, Hammond, Ind., was reelected chairman of the Board of Directors. Other directors elected were B. T. duPont, Plastic Metals, Inc., Johnstown, Pa.; Walter M. Weil, National Smelting Company, Cleveland, Ohio; and P. E. Weingart, the American Metal Company, Ltd., New York.

H. E. Hall, Metals Disintegrating Company, Elizabeth, N. J., and S. K. Wellman, S. K. Wellman Company, Cleveland, Ohio, were reelected president and vice president, respectively.

This was the first meeting of the association since its constitution was amended to include consumers of metal powders as well as producers of metal powders as regular members, and to include consultants, research workers, equipment suppliers and others with an interest in powder metallurgy as associate members. Consequently all of these groups were represented at the meeting.

A feature of the meeting were reports from the Granular and Flake Powders Standards Committees and the Safety Committee. The Safety Committee report covered the activities of three sub-committees on Health, Fire and Explosion Hazards, and Accident Prevention, while the Granular Powders Standards Committee report covered five methods for testing metal powders already adopted as tentative standards. Copies of these reports may be obtained from the Metal Powder Association, 420 Lexington Avenue, New York 17, N. Y.

Trojan Starts Mill

The Bald Mountain Mining Co., at Trojan, has started milling operations at its 350-ton cyanide plant following a long period of idleness due to the order of the War Production Board suspending all gold mining operations during the war. The mine along with all other gold mines throughout the United States became entirely inactive when WPB ordered the closing of all gold mines.

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PARMANCO Horizontal Drills are used exclusively in the Iron Range for horizontal drilling.

They are also used by a large percentage of the strip coal mines.

The new PARMANCO Vertical Drill has revolutionized test drilling.

Write us your drilling problems.

PARIS MANUFACTURING CO.

PARIS, ILLINOIS

The mine at Trojan kept a skeleton crew for essential maintenance.

The Bald Mountain Co. is at present operating on a comparatively small scale with 70 men and is milling at the rate of 125 tons a day. The company in normal times employs 180 men with a normal daily output on full scale operations of 375 tons.

Officials of the company hope to increase the tonnage as fast as the crew can be built up, which they hope will be soon. Most of the men now employed are those who have been previously employed by the company. Only a comparatively few new men are among the present crew.

C. E. Dawson is general manager, although no longer active. N. P. Goodrich is acting manager, D. E. Moulds is assistant manager, and C. E. Bender is mine superintendent.

Credits Geological Surveys

Editor, Mining Congress Journal:

In the June, 1945, issue of your journal an article was published entitled "New Zinc Mines in the Old Galena District of Illinois," by Francis Church Lincoln, formerly of the Bureau of Mines. This article described that district and told of work done by the Bureau of Mines, but through mistake made no mention of the fact that the project was a cooperative one with the Illinois State Geological Survey and the Geological Survey of this Department, whose geologists logged the drill holes, mapped the geology and aided in selecting areas drilled.

The Bureau of Mines regrets that it failed to give credit to these organizations for the good work that they did there, and requests that you so inform your readers in some early issue.

Sincerely yours,

R. R. SAYERS,

Director, U. S. Bureau of Mines.

Foreign Soil Improvement

International Minerals and Chemical Corporation has sent Comm. George W. Moyers, phosphate division sales manager, to Europe to establish a foreign sales organization, according to President Louis Ware.

Comm. Moyers left New York November 14 for England, France, Belgium and The Netherlands to set up sales outlets to replace the ones suspended during the war. He will also survey markets and investigate phosphate changes in Europe since 1939.

Mr. Ware points out that the soil of Europe is badly in need of phosphate. "The tonnage required to bring it back to pre-war crop producing strength will be much greater than needed during the years preceding the war. Since 1939, phosphate has been practically unobtainable in Europe, and constant cultivation without ade-

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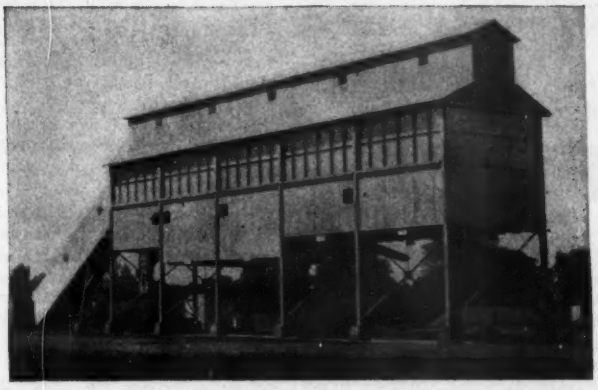

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Gently deposit fragile materials on the peak of the pile in bulk storage bins, eliminating vertical drop.

Holmes Dust-O-Lator

This is a self-contained unit, combining a withdrawal gate, mechanical screen, and automatically controlled power unit for use in removing objectionable dust and fines from the coal as it flows to the truck.

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BINS - GATES - LOWERING SPIRALS - DUST-O-LATORS - SHAKING GATES
DANVILLE, ILLINOIS

quate fertilization has the soil's chemical content out of adjustment. This explains their critical need for increased phosphate imports."

Recent conferences with foreign bankers have convinced Mr. Ware that financing of purchases in most European countries will pose no problem. Phosphate will enter Europe as fast as it can be mined and as ship bottoms become available. International will expand its phosphate division so it may "improve soil wherever soil is cultivated.

"We intend to supply all comers, from the governments of the world to the cabbage-patch farmer. People are hungry, and International intends playing its part by producing plant food to raise food crops."

International Mining Day

The mining committee of the El Paso Chamber of Commerce can record another successful get-together of the mining men of the Southwest. Beginning with a ranch style breakfast in the Victory Room of the Chamber of Commerce Building, the meeting became a series of pleasant and instructive gatherings. Karl O. Wyler, president of the Chamber stated in the program preface: "A rugged individualist is the 'hard-rock' miner. Since the year one of the mining era, he has sought out and worked his claims, staking all, figuratively, on a turn of the card. Playing a lone hand, never asking help, it is his proud boast that, win or lose, he started out 'with only his two hands and guts, no social security.' But times change. Everybody, some time or other, needs help. And the most effective way to obtain help is to cultivate informed and sympathetic friends. Today, we in El Paso are trying to turn the entire International Southwest into a mining-conscious community. That is the goal of the 1945 International Mining Day celebration."

Each registrant received complimentary tickets to the ranch breakfast, cocktail and buffet dinner, tour of Biggs Field (inspection of B-29's), luncheon at the Texas College of Mines, and Sourdough Supper. These events were particularly well staged and were enjoyed by several hundred visitors. Exhibits by a number of local mine machinery distributors were on display during the entire convention on the mezzanine floor of the Cortez Hotel.

There were two technical highlights: the address, *Wartime Achievements and Reconversion Outlook From Viewpoint of War Production Board*, by F. H. Hayes, Deputy Vice Chairman for Metals and Minerals, WPB, and the popular lecture, *Atomic Power*, by Dr. W. W. Lake, head of the Chemistry Department, Texas College of Mines.

Mr. Hayes' address was presented during the business session on the afternoon of November 2. Dean E. M. Thomas, general chairman, welcomed guests as did also D. L. P. Duke, Mayor pro tem of El Paso, and Karl O. Wyler, president of the Chamber of Commerce. Response came from Robert W. Thomas, representing Harvey S. Mudd, president of A. I. M. E.; E. C. Anderson, director, New Mexico Bureau of Mines; Charles Dunning, director, Arizona Department of Mineral Resources; and R. S. Palmer, secretary, Colorado Mining Association.

"The outlook for metals in the postwar period is bright," Mr. Hayes said. "Civilian needs for products using metals are tremendous. Let us apply the same degree of resourcefulness that we put into the war program and make the peacetime years prosperous."

Reconversion steps already taken were outlined by Mr. Hayes. They are: Experimental model order, authorization for reconversion tooling, starting of plant construction and scheduling of equipment orders.

"The demobilization of controls has proceeded at a swift pace and the policy is to get rid of all orders as soon as they are not needed," Mr. Hayes said. He quoted figures to show the net increase in new supply from 1939 to 1944: Magnesium, over 3,300 per cent; aluminum, over 400 per cent; nitrogen chemicals, 126 per cent; steel, 86 per cent; and copper, 72 per cent.

We have accumulated stockpiles of various critical and strategic metals, minerals and other materials. Serious thought has been given to the proper disposition of the surplus equipment and materials and of the stockpiles of raw materials."

He reported that "progress in reconversion will determine the time at which the insurance stocks accumulated during the war can be transferred to the postwar strategic stockpiles." These reconversion stocks are used only to supplement deficiencies in the domestic supplies and every effort is being made to prevent the dumping of excess stocks on the market.

Materials in short supply at present are tin, lead, and antimony. Importation of these metals is vital to our production picture. "Conditions are not yet settled to the point where peacetime arrangements, free from government controls, can be made."

Until industry can get more labor for the mines and ascertain the possibilities of foreign supplies of these metals, there must be some regulation on the manufacturing of products which use these metals. "Inventory controls are necessary not only on these tight metals, but on some in more plentiful supply so that hoarding cannot force them into being bottlenecks to reconversion."

The WPB ended November 3 under an order issued by President Truman and its functions and powers will be handled by the Civilian Production Administration. Hayes outlined its functions as follows:

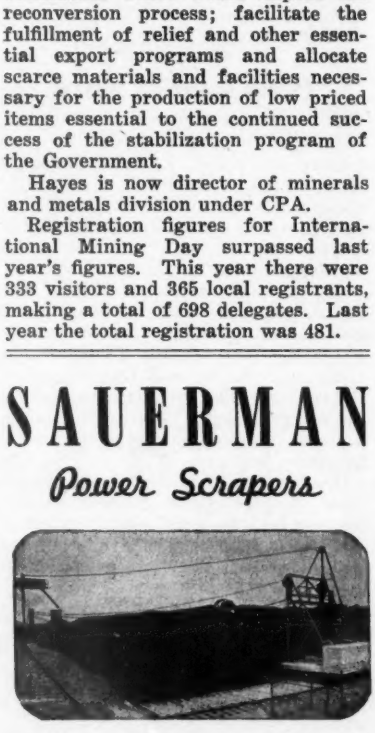
To expand the production of materials which are in short supply; limit the manufacture of products for which materials or facilities are insufficient; control the accumulation of inventories so as to avoid speculative hoarding and unbalanced distribution which would curtail total production; grant priority assistance to break bottlenecks which would impede the reconversion process; facilitate the fulfillment of relief and other essential export programs and allocate scarce materials and facilities necessary for the production of low priced items essential to the continued success of the stabilization program of the Government.

Hayes is now director of minerals and metals division under CPA.

Registration figures for International Mining Day surpassed last year's figures. This year there were 333 visitors and 365 local registrants, making a total of 698 delegates. Last year the total registration was 481.

SAUERMAN

Power Scrapers



PICTURED above is a typical power scraper installation as laid out by Sauerman engineers for storing and reclaiming large daily tonnages of coal, ore, or other bulk materials.

This Sauerman system, operated by one man, is handling a storage pile 35 ft. high covering 105,000 sq. ft. of ground. Moving material to or from any point in the area, scraper handles an average of 100 tons an hour at a cost of about 3c a ton.

For details of other Sauerman scraper layouts for stockpiling, excavating and strip mining, write for our catalog.

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Western States

Idarado Adds 500-Ton Unit

Idarado Mining Co., operator of Treasury Tunnel mine, is installing an additional 500-ton mill unit which is expected to be in operation by the first of the year. The mine is now employing 135 men and putting on additional employes as rapidly as they can be had. Present mill facilities are unable to treat the ore mined.

Fred Searls, Jr., head of the Newmont Co., with Gus Mrkvicka, assistant treasurer, recently looked over the property for further expansion. The company has purchased a large number of additional claims and now has a big slice of the rich Red Mountain mining district. Reported indications are that this may be one of the biggest mines of Colorado and the West.

With completion of the raise being driven to hit the old Black Bear workings a vast tonnage of ore will be made available. The raise should be completed early next spring. Production then will be increased greatly.

Idarado stock is owned 95 per cent by the Newmont Mining Corp. It is understood the Idarado is to be one of the corporation's largest operations. A large development program is already scheduled and most of the Treasury Tunnel holdings are of proven ore value.

Lucky Strike Plans Steam Shovel Output

Those who call the United States a "have not" nation in the mineral field, should see the Lucky Strike mine on Sheep Mountain in the Kokomo district, report Colorado observers. Two tunnels have developed large bodies of lead-zinc ore in this property and now at the surface bulldozers are stripping the ore for a new steam shovel development.

The Lucky Strike was started by a small Denver syndicate, which opened ore in the upper tunnel and made some shipments that returned at the rate of $4,500 per car or better, including premium payments made by the Government. Quite a little of this ore averaged 50 per cent lead.

The American Smelting & Refining Co. later negotiated a deal paying, it is reported, $35,000 for the property. Now local opinion is that the big company has developed a potential million-dollar property in the Lucky Strike. The small group who got an interest for their early financing still retain this interest and a partnership in the operation.

American Smelting & Refining Co. bought the mills of the California Gulch Mining Co., at Leadville, and remodeled the larger, which has a capacity of between 250 and 300 tons of ore daily, the smaller and older mill being held in reserve. The company mills ores for lead and zinc from the Lucky Strike and in addition mills ores of other operators on a custom basis.

Gilsonite Blaze Near Vernal, Utah

Flames which continued for nearly two weeks were finally extinguished late in October in the last of 15 shafts at the Bonanza, Utah, gilsonite mine at which two explosions wrecked the Utah-Colorado border community October 9.

Miners filled the shafts with earth to smother any sparks which might again touch off the highly volatile mineral. The model mining town, 50 mile southeast of Vernal, is resuming normal operations.

Barber Asphalt Co.'s gilsonite operation, where a $1,500,000 improvement and modernization program was completed in the past 18 months, is slated for further expansion, according to a recent announcement by C. S. Thomas, Denver consulting engineer for the company. A $30,000 Raymond mill pulverizing plant is being installed to meet a new demand for gilsonite. Gilsonite dust collected in the washing plant, at first considered virtually a waste product, found a ready market for use in foundry cores.

Sheets of flame from blazing gilsonite mine pits menaced the 50 model homes in Bonanza. Some of the 15 shafts which belched forth molten tarlike gilsonite following the explosions, had to be filled with tons of earth which extinguished part of the fire.

Trucks and planes from Denver were sent out with badly needed fire hose into the stricken community to help fight the huge fires.

Report on Nevada Mining Activity

A total of 102 mines were operating in Nevada at the close of the 1945 fiscal year, and as of this same period 3,421 men were employed at mining. Matt Murphy, state mine inspector, said that Clark County, with 13 properties operating, headed the State in number of active mining properties. White Pine County, however, where the big copper mines operate, continues to employ most men.

There are 12 mines operating in Elko County. Lincoln, Pershing and White Pine counties each have 10 companies operating. There are no mines operating in Ormsby nor Douglas counties.

Resumption of mining and milling by the Dayton Consolidated Mines Company below Silver City, is expected to start in the near future. Prior to the closing of precious metal mines in Nevada this mill, a 150-ton cyanide plant, was the foremost processor of custom ores in the State, serving mines over a large section, particularly from the area adjacent to the Comstock district.

Uravan, Colorado, where the United States Vanadium Corporation's vanadium mining operations have developed an important source of uranium

The Eagle-Picher Mining and Smelting Company has filed its charter with the Nevada secretary of state in Carson City. A representative of the company was in Nevada recently seeking information concerning lead properties in this state.

The Airlanes Gold-Copper Mining Company, headed by a group of San Francisco men, has filed articles in this State and acquired properties in the Stillwater range and a half dozen rhyolite porphyry claims in Limerick canyon in the Humboldt range. The officers report they will start work on a mill shortly.

Mining Association Initiates News Service

Conforming with the action of its Executive Committee, the Mining Association of Montana has issued its first *News Letter*. This will take the place of and supplement letters intermittently sent to members. The Mining Association of Montana, organized in 1934, has many activities, most of these being devoted to solving the economic problems of the small mining industry of Montana, as well as to aid in preventing the enactment of laws, rules and regulations, both state and national, that would put an unreasonable burden on industry; and to urge the passage of helpful laws.

In addition to several pages of interesting comment on important mining matters, the first bulletin carried the following local mining news:

Consolidated Mining & Smelting Company of Canada, owning a majority interest in the Montana Phosphate Products Company, has purchased the minority interest of Willian Anderson. The last named company operates three phosphate mines near Garrison, R. B. Shelledy being president and general manager. Mr. Anderson has been examining phosphate properties near Conda, Idaho.

U. S. Vanadium Corporation has dismantled its chrome plant at Red Lodge, the equipment and materials having been sent to other plants of the company in Colorado, Nevada and New York, according to a statement of John R. Monro, assistant general superintendent of the company.

Martin Bros. of Butte and Winston Bros. Company of Minneapolis have taken over the Golden Sunlight Mine near Whitehall from the A. O. Smith Corporation of Milwaukee. Considerable experimental work is being performed to develop a process to economically beneficiate the large low grade gold ore bodies on that property. A. Strojan, Jr., of Helena, is Montana manager of Winston Bros.

Research On Cooling of Hot Mines

Research on the problem of cooling hot mines has been initiated by the University of Arizona engineering experiment station, and tests preliminary to the construction of an above-ground cooling plant by the Magma Cooper Company of Superior will be completed by next spring, according to P. M. Thornburg, mechanical engineering department head in charge of the project. Study will center largely around water as a cooling agent.

An atmospheric cooling plant of pilot size will be constructed in the university laboratories, and the university will publish the results as general scientific knowledge, according to Mr. Thornburg. The research program is being carried out cooperatively with the Magma company and the engineering firm, J. F. Pritchard and Company of Kansas City, Mo.

Zinc Production Increase Expected

Arizona's daily production of zinc concentrates and high grade ores is 500 tons, and will increase when improved smelter facilities are available, according to a report by Charles H. Dunning, director of the Arizona Department of Mineral Resources.

Zinc production in Arizona has quadrupled since 1939 from 6,711 tons to 29,000; and improved metallurgy and mining facilities have turned zinc into profitable channels, according to the mines bureau director. He also said that it costs the Arizona producer approximately $35 a ton to deliver zinc ore or concentrates to a smelter.

State Mining Developments Encouraged

Many new members are being added to the rolls of the New Mexico Miners and Prospectors Association, since the opening a month ago in Albuquerque of Association headquarters in charge of Secretary R. H. Downer. Mr. Downer since 1906 has been active in mining in Colorado, Nevada, Idaho, Oregon and California. His office assistant is his wife, Mrs. Helen Hurlburt Downer, a member of the New Mexico state bar.

The New Mexico State Bureau of Mines and Mineral Resources, under the new director, Eugene C. Anderson, has now been reorganized into the Mining Division, under T. D. Benjovsky, and the Oil and Gas Division, under R. L. Bates. Its headquarters are at the New Mexico School of Mines at Socorro.

S. G. Lasky, of the United States Geological Survey, has been assigned to New Mexico to do preliminary work on a survey to determine the "earmarks" of hidden ore bodies, principally copper, zinc, lead, manganese and fluorspar. Large bodies of these minerals already constitute the production of major companies operating in the Silver City mining area of Grant County. This area is to be mapped from the air and the mosaics to scale made available for research.

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Idaho's Mineral Future

Stanly A. Easton, president of the Bunker Hill & Sullivan Mining and Concentrating Company, was the principal speaker at the annual fall meeting of the North Idaho Chamber of Commerce, held this year in Kellogg. Mr. Easton spoke on the subject: "Metals in the Post-War Industry." He said:

"To my way of thinking, the only safe and enduring conservation policy is to encourage the search for and development of new ore bodies in every way. I prefer to supplement our domestic supply and maintain an adequate mineral resource by fostering and stimulating our domestic industry, especially by encouraging the expenditure of risk money, in the finding and in the extending the known resources of older fields and in promoting mining and metallurgical efficiency. This is a historic experience which has resulted in adequate mineral production during the entire life growth of the nation."

The tax laws governing the mining industry, such as the excess profits tax and other burdensome taxes, should be changed to allow for expansion money for the industry, he said, and continued:

"Our mining industry, especially here in Idaho, is definitely sound, with adequate mills and equipment and metal resources. The uncertainties of the future are wholly external and, after mining experience of many decades, sometimes when the going was exceedingly tough, I still look forward to the future with complete confidence."

High Divide to Move More Gravel

The first clean-up was being made early in November by the High Divide Mining Company on the upper Trinity placer property. Washing operations are underway on the lower part of the ancient channel where there is sufficient water for a continuous operation. The management is moving a ¾-yd. shovel to this operation to increase the daily capacity to 2,000 yds. Negotiations are being completed for two dredges to be put in operation on the river channel early in the spring of 1946. Testing now going forward in the channel indicates the values will be fully substantiated in the engineer's preliminary report (.77 per yd.).

Thomson Divide Has New Dragline

The Thomson Divide Mining Company has moved a new dragline, said to be the first to arrive in the Northwest California mining district, on to the east fork of the Trinity River at Squirrel Gulch. The new dragline of 1½-yd. capacity was purchased to replace a smaller shovel of ¾-yd. capacity and will more than double the capacity of the boat now on location there.

The Thomson Divide lease comprises 6,340 acres of placer ground with approximately 85,000,000 yds. of gravel that preliminary engineering reports showed to average 28c per yd. Subsequent test shafts indicate that the engineers' preliminary report of values averaging 28c per yd. was conservative. Eleven test shafts at Squirrel Gulch showed an average value of $.406 per yd. excluding nugget values.

New Mines and Geology Division

The Department of Conservation and Development at Olympia, Wash., through Art Garton, director, has announced the consolidation, effective October 1, of the Division of Geology, Pullman, with the Division of Mines and Mining at 420 Transportation Building, Olympia. All activities of both agencies will be combined in the new Division of Mines and Geology under the direction of Sheldon L. Glover, supervisor.

All correspondence and exchanges should be directed to the new address: P. O. Box 207, Olympia, Wash.

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TYPE KSA is for substation use in protecting and controlling automatic or semi-automatic m-g sets, rotary converters and mercury-arc rectifiers.

TYPE KSC is used in sectionalizing service to localize faults to maintain maximum production at reduced cost for power, maintenance and repairs.

LOAD DISTRIBUTORS . . . for panel mounting in glass front, dust-proof case, improve service from two or more m-g sets or rotary converters in parallel on same system but at widely separated locations. Generator loads are balanced to prevent over-heating, outages are reduced, peaks are limited and life of equipment prolonged.

AUTOMATIC SWITCHBOARDS . . . for automatic protection and control of motor-generator set and rotary converter substations. Much of the equipment, including circuit breakers and protective relays, has been designed specially for mining service. Mounting is simplified and there is much flexibility in space arrangements.

For full details, write today for Bulletin 2802. I-T-E CIRCUIT BREAKER COMPANY, 19th & Hamilton Sts., Phila. 30, Pa.

I-T-E *Representatives in Principal Mining Areas* AIR SWITCHGEAR

GRUENDLER MASTER BUILT

COAL CRUSHERS

For Specific Sizes...Minimum of Fines...Peak Production

MODEL XC with 15"x 24" Hopper Opening

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OUR 60th YEAR

- Low head room and large hopper opening
- High capacity 60 to 75 tons per hour, 1½" minus
- Ring Hammer Principle—slow speed—uniform graduation for stoker sizes
- Simple, effective built-in metal trap.

OVER 200 COAL CRUSHERS INSTALLED AT ARMY CAMPS SINCE PEARL HARBOR

GRUENDLER

CRUSHER and PULVERIZER CO., ST. LOUIS 6, MO.

MANUFACTURERS FORUM

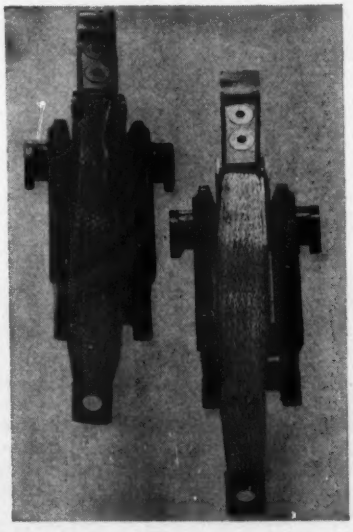
Roberts and Schaefer Expand Facilities to Aid Coal Output

Extensive expansion has been begun at their Harvey, Ill., plant, says a spokesman for Roberts and Schaefer, engineers and builders of coal processing plants and equipment. The additional space will be devoted to shop and testing operations and will speed production of R & S Hydro-Separators, Hydrotators, and Stump Air Flow Cleaners.

Accelerated demands for accurately graded, clean coal are straining the present facilities of many coal producers, and Roberts and Schaefer hope to increase the availability of their equipment to meet these demands.

High Arc Resistance for Electrical Control Parts

The high arc resistance offered by American Cyanamid's rag filled Melmac plastic is shown by this electrical control part, used on mining machinery, which broke down because of a short circuit between main line contactors. Contrast against a stock part shows that the metal portions of the mechanism fused upon contact with the great heat, while the plastic insulation was scarcely affected. Had the insulation been destroyed, the short might have passed on to other parts of the unit, resulting in additional damage and perhaps in fire.



Joy Manufacturing Co. have adopted rag filled Melmac for use as insulation on all electrical controllers. Reasons listed for the selection of this molding material: excellent electrical properties, heat resistance, exceptional strength and shock resistance plus the unique characteristic of resisting a nitrate deposit even when exposed to an electric arc in the presence of moisture.

Explosive Rivet

An explosive rivet especially adapted to meet the needs of peacetime mass production methods is announced by E. I. du Pont de Nemours & Company. This improved rivet is the latest development in the explosive type of "blind" fasteners used extensively by the aircraft industry during World War II. They are fastened in place by firing a small explosive charge within the shank of the rivet.

Retaining basic features of previous types, the improved design is reported to eliminate the necessity for close tolerance drilling and provide rivets which will accommodate a wide range of metal thicknesses. These features are in direct contrast to those of the explosive rivets supplied to aircraft manufacturers where precision tolerances and a wide variety of lengths were required.

After explosive rivets are in place one person applies the tip of an electrically heated iron to the rivet heads. Heat fires the explosive charge within approximately two seconds. The shank of the rivet is expanded to fill the hole completely and a barrel-shaped head is formed on the "blind" end to lock the rivet securely in place. The strength of these rivets is only slightly less than that of conventional solid rivets.

These improved rivets are now provided in ⅛-in., 5/32-in. and 3/16-in. diameters, the du Pont Explosives Department says, and will be produced in additional sizes. They are made of various materials including several aluminum alloys, brass, copper, mild steel and Monel metal.

Pneumatic Air-Speed Saw

A new air-speed saw and filing tool driven by compressed air is ready for national distribution, according to the Air-Speed Tool Company, distributor, 1028 W. Slauson Avenue, Los Angeles 44, Calif.

Designed to simplify and speed-up

most sawing and filing operations, the Air-Speed tool, it is reported, can be worked advantageously in awkward or cramped quarters or from difficult positions. An adjustable barrel readily permits circular sawing in metals or woods, as well as difficult "dead end," keyhole or scroll work. Balanced for ease of handling, and weighing only 3½ lbs. complete, the new tool features finger tip speed and power control, and a simple cutting stroke adjustment of from ¼-in. to 1¼-in.

Horizontal Drill

The Salem Tool Company, Salem, Ohio, announces a new horizontal earth boring machine, known as the McCarthy drill, a machine designed by a strip mine driller.

The hydraulic unit feeds the augers, and is reported as eliminating all manual feeding and enabling much

faster drilling. The operator can raise the machine as much as 4 ft. from the ground or truck bed with the new type jacks. The unit weighs 3,500 lbs. and the compact design is said to make transportation easy from one job to another.

The McCarthy earth boring drill can be furnished in truck-mounted, trailer-mounted, self-propelled horizontal type and in a few weeks a vertical type will be introduced.

The Salem Tool Company manufactures all types of augers and distributes all types of mining tools and supplies.

Warmer Daylight Fluorescent Lamps Ready

Fluorescent lamps which furnish a new and warmer-appearing daylight color, known as "4,500 degree white," soon will be in production, according to the Westinghouse Lamp Division.

Made possible by developing a new formula for making and mixing the phosphor crystals which produce the regular daylight and white light, the new color is described by Eugene W. Beggs, commercial engineer, as about midway in color quality, as well as light output, between the present standard white fluorescent lamp and the daylight lamp. The standard white and daylight lamps will still be available.

Initially, the new color will be offered in only the 40 and 100-watt sizes, the two most popular fluorescent lamps for industrial and commercial applications.

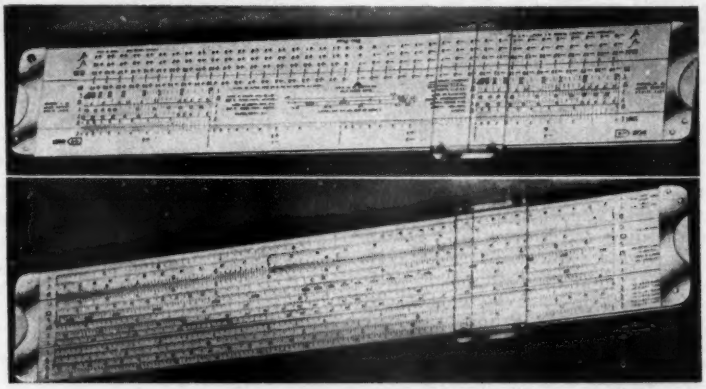
Cam Lever Handling of Steel Barrels, Plates, Etc.

A cam-lever mechanism and chain said to grab up a heavily laden steel barrel, or steel plate and hold it in a vice-like grip that grows tighter the heavier the load, is announced by the Boyer-Campbell Company, Safety Division, 6540 St. Antoine Street, Detroit 2, Mich. The device is to be known to the trades as "Granny Grip" —no teeth but what a bite. The standard unit consists of two stamped alloy steel bodies (cam lever mechanism) and Herc alloy chain that is capable of lifting any load that its ¾-in. jaws can be slipped over.

"Granny Grip" is particularly designed to facilitate handling of material with industrial trucks and cranes—all around the plant and yard. Quickly installed in a few seconds—"Granny Grip" let's go immediately the load is put down. With only one moving part (cam lever) it is stated that there is nothing to get out of order—nothing to wear out.

Deci. Point Slide Rule

Several important new features are said to be incorporated in the Deci. Point Slide Rule. It places the decimal point at the end of long and intricate computations. It will, it is claimed, determine the precise location of the decimal point in involved expressions with results up to 19 places.



The slide rule is being manufactured of light-weight Dowmetal. Dowmetal permits superior accuracy as it is not affected by climatic conditions of heat, cold or moisture. There is no perceptible warping, swelling or other distortion. Moreover, it can be machined to extremely close tolerances. This permits the use of self-centering "optical groove"—a type of tongue and groove construction favored in optical instruments because it prevents side play and binding.

The scales are placed on a flat white plastic that is impervious to water or chemicals and virtually immune to abrasion from regular use.

Mathematical, rather than mechanical advances, are reported to make Deci. Point an outstanding improvement over ordinary slide rules. In operation, the user has several advantages. Manufactured by Pickett & Eckel, 53 W. Jackson Blvd., Chicago 4, Ill.

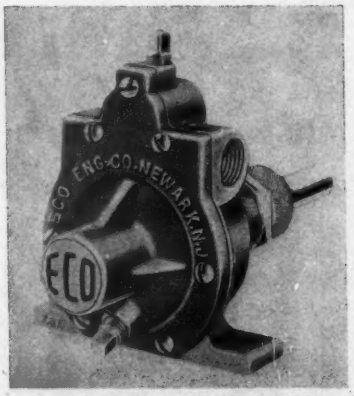
Gearless Pump

A gearless pump for water, light, oil or other liquid circulating use has been introduced by Eco Engineering Company, Dept. 90, 12 New York Avenue, Newark 1, N. J.

One feature is bearings which require only water lubrication, eliminating the need for grease cups. No adjustments are needed, all metal is of bronze and pump can be used in oil, or fresh or salt water, according to reports.

Pump can be easily installed, can be mounted at any angle and operated in either direction with equal efficiency.

The impeller, which is removable,



is of tough resilient material composed of several layers of laminated sections, vulcanized together under great pressure. It enables sandy, muddy, or gritty particles to pass without harm to the pump should they get in the water or oil system.

—*Announcements*—

American Chain & Cable Company, Inc., Bridgeport, Conn., has acquired the business of the Certified Gauge and Instrument Corp., of Long Island City, New York.

* * *

The retirement of Edmund T. Lednum, manager of its explosives department branch office in Chicago, effective December 1, is announced by the **E. I. du Pont de Nemours & Company.**

Gilbert H. Smith, who has been assistant to Mr. Lednum, will become manager of that office.

John J. Heffernan, manager of the explosives department's branch office at Joplin, Mo., retires December 1.

Robert O. Cash, assistant manager since July, will become manager.

* * *

Appointment of Frederick W. Roth as works manager of the **Storage Battery Division of Philco Corporation** is announced by M. W. Heinritz, vice president in charge of the division.

* * *

The **Cummins Engine Company, Inc.**, has reorganized its sales department, creating two new sales divisions.

In the reorganization, Norman E. Palmer becomes general sales manager, J. D. Allen becomes sales manager of dealer organizations, and Fred W. Sparks becomes sales manager of manufacturing accounts. Byron A. Duling becomes manager of the Cleveland region. Offices for the region, which includes Ohio, Michigan, and a part of Pennsylvania are located at 805 Fidelity Building, Cleveland 14, Ohio.

Appointment of Lt. Col. H. P. Valentine as manager of dealer sales and operations is announced by A. C. Fetzer, vice president of **Mack-International Motor Truck Corp.**

Colonel Valentine has been chief of the Transport and Automotive Branch, Production Division Headquarters, Army Service Forces, with staff responsibility for the Army's huge war production of automotive, shipbuilding, construction machinery and railway equipment. Prior to his war service, he was with the Chrysler Corp. for 11 years.

* * *

L. D. T. Berg, sales engineer in **General Electric's** Electric Welding Division, Schenectady, has been appointed welding specialist of the company's Atlantic District with headquarters in Philadelphia.

* * *

James A. Windram has been appointed manager of the St. Louis district of the Industrial Products Division of **The B. F. Goodrich Company.**

He succeeds George Livermore, who is retiring from the company after service of 30 years.

* * *

The appointment of Dale Christopher as district manager has been announced by the **Duff-Norton Manufacturing Company** of Pittsburgh, Pa. Mr. Christopher will maintain headquarters at Morgantown, W. Va., and direct company sales in the coal mining areas of Pennsylvania, West Virginia, Kentucky, Alabama, Ohio, Indiana, and Illinois.

* * *

Thomas J. Hilliard, vice president in charge of sales of **Carnegie-Illinois Steel Corporation**, has announced the appointment of Marcus M. Chapman as manager of sales, Sheet Division, effective November 1. He succeeds Howard V. Clark, who recently resigned.

* * *

Kensington Steel Company control has been acquired by Poor and Company who have owned a substantial stock interest in it for many years. Kensington has been producing ORO manganese and alloy steel castings since 1926 and will continue under the same management: Eugene C. Bauer, president; Kenneth Jensen, vice president; R. W. Sergeant, secretary-treasurer; and E. C. Anderson, sales manager.

Current window display at Chicago Pneumatic Tool Co.'s head office in New York, depicting the part being played by pneumatic tools in rebuilding shattered Europe

CATALOGS AND BULLETINS

CENTRIFUGAL PUMPS. *The LaBour Company, Inc.*, Elkhart, Ind. Bulletin No. 51, describes packingless, self-priming centrifugal pumps. Technical details of design as well as other useful pumping information included.

CUTTING ELECTRODES. *Ellwood Products Corporation*, Ellwood City, Pa. A new bulletin on Ellpro Cutting Electrodes, for underwater or surface cutting. Bulletin gives complete details and specifications, together with a fully illustrated description on how to use the electrodes, and describes the Palmgren Arc Oxygen Kit for Underwater Cutting, used with Ellpro Cutting Electrodes. Copies available through this publication or direct from Ellwood Products Corporation.

INDUSTRIAL TIRES. *The B. F. Goodrich Company*, Akron, Ohio. Thirty-eight-page booklet on industrial tires, "How to Save Money on Industrial Hauling Jobs and Equipment." Copies are available upon request.

Description with text and pictures of each tire in the B. F. Goodrich industrial line is followed by complete data on each tire. Ten pages are devoted to specifications for a partial list of power trucks and tractors by United States manufacturers, with the model, type, truck capacity, and tire sizes listed.

MODERN PH AND CHLORINE CONTROL. *W. A. Taylor & Co.*, 7300 York Road, Baltimore 4, Md. A completely revised edition of the Taylor combination handbook and catalog, contains both simple and technical explanations of the meaning of pH control; specific discussions of the application of pH, chlorine and phosphate control to 35 industries; the precautions to be observed in making determinations; and descriptions of all Taylor outfits, including 8 new sets. Copy free on request.

COAL CUTTERS (SHORTWALL). *The Jeffrey Manufacturing Company*, Columbus 16, Ohio. Catalog 787, describes the various types of this cutter available and gives details of controls, construction and application.

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VENTILATING COMPANY
•
Fans and Blowers
Ventilating Engineering Service
•
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Our specialty—Testing bituminous coal lands
Satisfactory cores guaranteed

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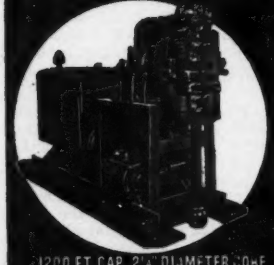
ESTING COAL AND ALL MINERAL PROPERTIES-USING CUT LIGHT GASOLINE DRILLS..THEY SAVE FUEL AND MOVING COSTS..WE GUARANTEE SATISFACTORY AND PROPER CORES..
PRE PRESSURE GROUTING FOR MINE SHAFTS...GROUND SOLIDIFICATION FOR WET MINE AREAS BY OUR STOP GROUT METHOD. WATER WELLS AND DISCHARGE HOLES DRILLED AND GROUTED...ELECTRIC DRILLS FOR INSIDE MINE DRILLING..
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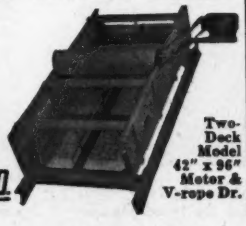
Two-Deck Model 42" x 96" Motor & V-rope Dr.

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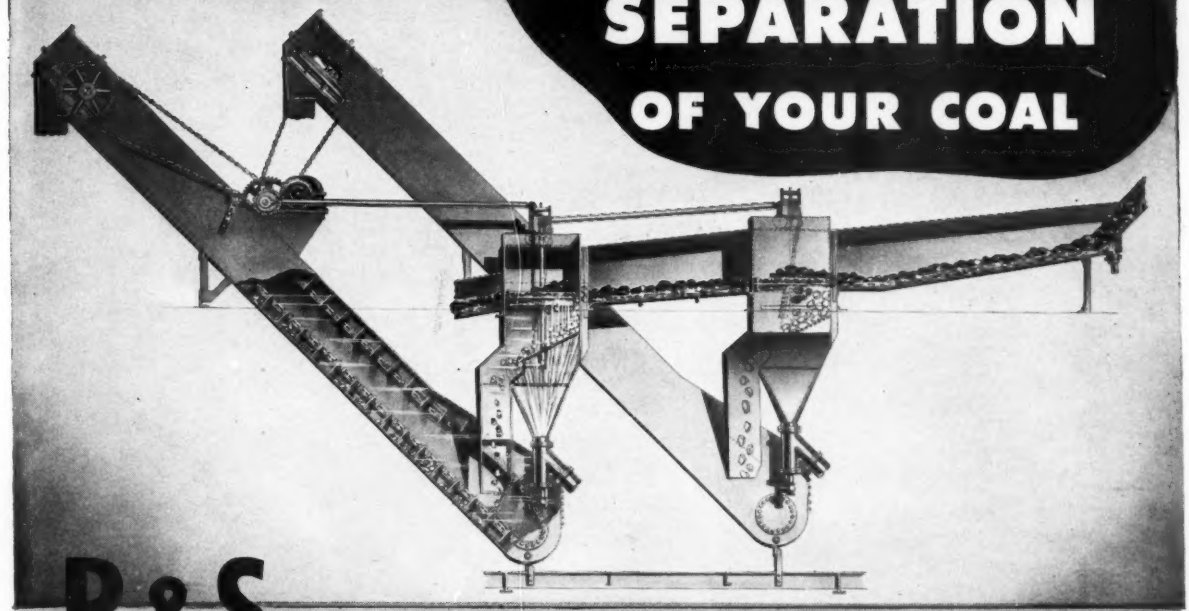
Continuous . . . *Clean*

SEPARATION OF YOUR COAL

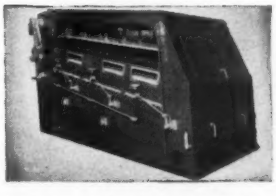


R&S TANDEM HYDRO-SEPARATOR

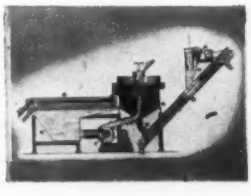
Windsor Power House Coal Co., Wellsburg, West Virginia, prepares coal for power plant use with R & S Hydro-Separators, pictured above. Mine run coal is crushed and screened. Large sizes are washed in Hydro-Separators. Small sizes are bypassed. Larger sizes are recrushed and mixed with the smaller sizes for delivery to power plant. The capacity of the Windsor plant is 450 tons of coal per hour.

R & S Tandem Hydro-Separators operate on a principle that assures automatic, fool-proof production of clean coal—a big statement that can be proved by many installations. R & S Hydro-Separators turn out a constant flow of uniform, high grade fuel. One operator controls the whole operation. Clean coal flows continuously through the Hydro-Separator cells with controlled water currents to effect the separation of refuse.

Write for bulletin No. 161 for full information.



Dry clean coal with air is efficient and economical in the R & S Stump Air Flow Cleaner. Ask for Bulletin No. 163.



R & S Hydrotators for fine coal washing are also automatic, efficient, and economical. Bulletin No. 162 gives a complete story.

R AND S COMPANY

ROBERTS and SCHAEFER CO.

307 North Michigan Avenue, Chicago

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PITTSBURGH, 21, PA.

P. O. Box 570
HUNTINGTON, W. VA.

BATTERY POWER IS SAFE

"The Bureau does not have a record of an explosion or a mine fire caused by permissible storage-battery locomotives that have been maintained in permissible condition."

U. S. Bureau of Mines
Information Circular I. C. 7302
November, 1944

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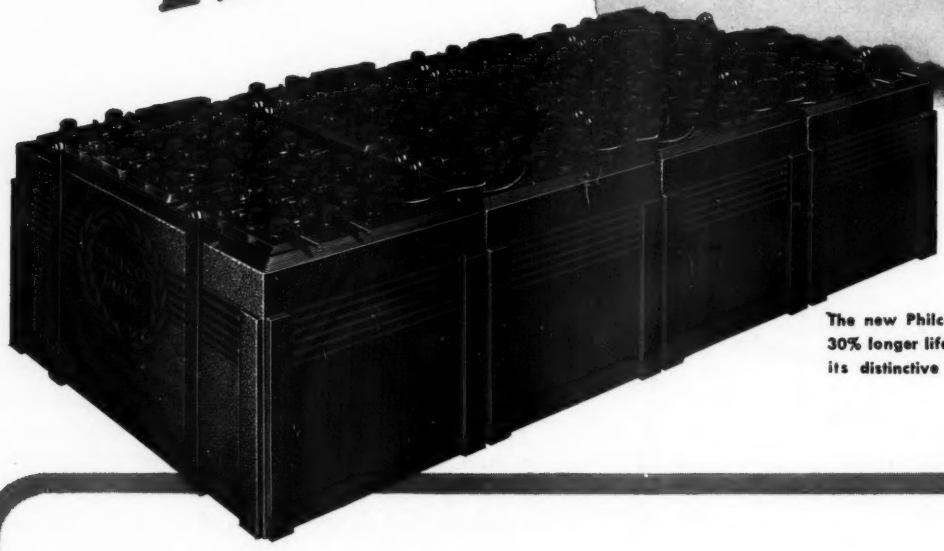

The new Philco "Thirty", with 30% longer life, is identified by its distinctive red connectors.

Tune in The Radio Hall of Fame, with Paul Whiteman and His Orchestra, Sundays, 6 P. M., EST— ABC (Blue) Network (Coast-to-Coast).

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Greater safety is one of the major reasons for installing battery-powered haulage equipment. Especially so, when you consider the low cost, ease of maintenance and long life of modern high-capacity Philco Mine Batteries. The new Philco "Thirty" with 30% longer life, has introduced a new era in low cost per ton hauled with battery-powered locomotives and shuttle cars. Write for the facts today.

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